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Yearbook of Moving Image Studies 2023

Cinematic Images: The Digital Condition of Moving Images

Lars C. Grabbe, Patrick Rupert-Kruse, Norbert M. Schmitz (eds.)

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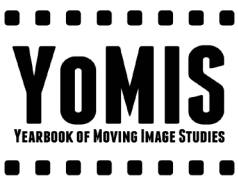
Cinematic Images



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Cinematic Images

The Digital Condition of Moving Images

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Lars C. Grabbe, Patrick Rupert-Kruse & Norbert M. Schmitz
November 2024

About the *Yearbook of Moving Image Studies* (YoMIS)

The significant work that led to the concept and idea of the Yearbook dates to 2011 and is closely connected with the initial establishment of the Research Group *Moving Image Science Kiel|Münster* in Kiel, Germany. Established as a doctoral seminar at the Christian-Albrechts-University in Kiel, the research group is now working in all areas of modern media and image theory, focusing on the essential role of visual media, technology and the structures of visual and pictorial media communication in the context of multimodality, intermediality or transmediality. The interdisciplinary research includes media and film studies, image science, philosophy of media and mind, phenomenological and semiotic approaches, art history, design theory, computer graphics, aesthetics, presence research, game studies, theories of perception and psychology and other research areas related to moving, technological, procedural, and dynamic images.

The academic engagement of the research group led to a series of conferences termed *Moving Images* (in 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2022, 2023 and 2024), which intended to discuss and reflect the concepts and structures of images used in traditional image sciences (in terms of static pictures or images) and in a modern perspective; according to new and immersive media and image technologies.

The necessary consideration for the establishment of YoMIS is the interdisciplinary connection of German, European and international media research to improve the academic exchange of ideas. Therefore, YoMIS is innovatively conducted as an electronic and print publication to enhance the range of impact.

The Yearbook is based on a prolific scientific cooperation of the University of Applied Sciences Kiel, the Muthesius Academy of Fine Arts and Design in Kiel, and the MSD—Münster School of Design

(FH Münster) in Münster; and is edited and published by Prof. Dr. Lars C. Grabbe, Prof. Dr. Patrick Rupert-Kruse and Prof. Dr. Norbert M. Schmitz.

YoMIS is conducted as a periodic forum for international scholarly and intellectual exchange and interdisciplinary discussion, not determined as a publication for a specific academic school or tradition. The editors are formulating the specific topic of each issue, but the members of the editorial board make the final decision for the publication of articles, in a double-blind peer review process. The content-related broadness of the different topics, and the variety of methodological approaches, forces a productive opposition of academic perspectives, which can certainly differ from the subjective perspectives of the editors.

Lars C. Grabbe, Patrick Rupert-Kruse & Norbert M. Schmitz
November 2024

Introduction

Lars C. Grabbe, Patrick Rupert-Kruse & Norbert M. Schmitz

The specific design and engineering of digital image technologies has evolved in the last years within the context of a so-called "digital turn", which addresses a computer-generated and software-driven imagery in the aesthetic field of moving images; from cinema to streaming services, social media reels, stories and the specific digital devices for image reception and interaction (like virtual reality head-mounted displays, tablets, smartphones or augmented reality or extended reality devices). This digital trend in the aesthetics of moving images is not only connected with developments in the post-cinema condition or with a focus on moving images in computer games but in very specific ways within the whole construction field of novel CGI effects, 3D or image interaction in the range of synthetic realities (cf. Grabbe, Rupert-Kruse, and Schmitz 2015). As with similarly fundamental breaks and innovations in media technology, the result is not a simple replacement of old forms by new ones in the sense of a mono-linear development, but rather a new integration and expansion in a changed reception dispositive in which classical forms of reception are continued quite directly with digital technologies, alongside numerous blends and independent areas of reception as further differentiations of media dispositives of individual and collective communication.

From a historical point of view, cinematic images were primarily connected with the specific cinema tradition of the classical style (or specific international traditions in technology use or storytelling) in the context of projection art or the innovations of optical toys that has nowadays constantly progressed into new fields of the moving image regarding specific image media technologies and movie distribution. Cinematic images as digital images are perceived in a story and plot perspective with specific dramatic and narrative aspects that are now highly influenced by the digital image aesthetics, like Gollum in the

Lord of the Rings franchise, the spaceships in *Star Wars* or the animals and whole organic lifeworld of the Navii in *Avatar: The Way of Water*. A specific classification or taxonomy of cinematic images, from a technological, digital, or CGI-aesthetic point of view, is still missing with the focus on its reception in contexts outside the classical cinema, like streaming, games or VR, XR and AR.

Therefore, the editors of this volume of the *Yearbook of Moving Image Studies—Cinematic Images: The Digital Condition of Moving Images*—wanted to address some research aspects that were recently discussed in the broad range of media theory, image aesthetics and digital art and design in general. Therefore, the articles in this book have some specific and necessary overlaps with the following questions that are highly significant to the field of cinematic image studies. The editors wanted to refer to questions such these: How do cinematic images relate to the complex tradition of digital moving image representations? Or, what are the specific technological elements and effects of cinematic images are in the perspective of post cinema? How are the specific narrative communication effects structured in contexts of use of cinematic images, like 3D images in stereoscopic cinema, CGI in games, or other technological devices in the range of VR, AR, streaming platforms, apps, projection mapping or holograms? Is it possible to clarify the aesthetic principles, levels, or aesthetic layers of cinematic digital images in the context of CGI, art, design, and computer graphics or rendering? Are there specific sensory, cultural, or perceptual conditions of digital cinematic images (of the post-cinematic era) that are important to be classified and discussed? And finally, is it possible to categorize cinematic digital images in an aesthetic, phenomenological, semiotic, philosophical, media theoretical or anthropological perspective?

Consequently, *Cinematic Images* will address the technological possibilities and media routes of cinematic digital images that are already affecting media communication in different social and technological—or better: media ecological—areas. Thus, the articles for this issue are concentrating on the specific variety of the pictorial aspects of cinematic images, the specific technological conditions and situations, and the development of graphic representations regarding the different CGI-interfaces of cinematic image communication. They include aspects of cinematic images as perceptual CGI artefacts, cinematic artifacts as 3D-real-world-simulation elements, the specific

digital performance of moving image technologies that are enabling a physical-world-narration, and the specific cinematic modes of user interaction in the context of interactive media, the different aspects of cinematic aesthetics, cinematic art, design, and communication in cinematic image conditions, the new forms of psychological and perceptual interaction and narration in cinematic media ecologies, the processual dynamic of cinematic and digital images, the embodied vision of CGI-narration and cognition, the effects and characteristics of cinematic illusions, the phenomenology or semiotics of user perception in cinematic image conditions, the coupling of digital cinematic moving images with the specific media devices, the digital image as a multimodal artefact, and the historical, cultural or philosophical evolution of cinematic and digital image representations in the era of post cinema (cf. Grabbe, Rupert-Kruse, and Schmitz 2019).

Lars Christian Grabbe argues in *Transformational Digitality in Computer-Generated Aesthetics* that in recent years, interaction and interface design have shifted from a focus on visual and auditory elements to exploring haptic and tactile potentials. This *technogenesis* aligns technology with sensory inputs, creating multisensory experiences that combine visual, haptic, and tactile stimuli through movement and interaction. Grabbe claims that these hyperaesthetic images challenge traditional image theories and require new analytical approaches to understand their multimodal nature, expanding sensory engagement in media technology.

In *Thin Air and the Dispersed Screen* Jens Schröter emphasizes that a common motif in many science-fiction movies is the depiction of highly advanced three-dimensional displays that project images in thin air without a screen. While this technology doesn't currently exist, a potential solution could be inspired by drone imaging, where dispersed screen points collectively create an image in mid-air. The article concludes by briefly discussing the rationale behind the imaginary concept of screenless images.

Sebastian Lederle argues in *The Precarious Contact Zone Between Post-cinematic Film and Its Environment. A Media Philosophical Perspective* that film is omnipresent and can establish flexible, intermedial relationships with its surroundings, transforming both cinematic and extra-cinematic environments in unpredictable ways. In the post-cin-

ematic era, film is no longer bound to a specific time or place, acting as a spatial operator with a dispersed, virtual presence. This constantly changing nature forces film to renegotiate its identity, blurring the lines between film and non-film as it integrates with the broader environment.

In *Pixel vs. Grain. Historical Reflections on the First Decade of the Digital Roll-out of Film Production and Distribution (1998–2010)* Marcus Stiglegger focuses on Thomas Elsaesser and describes the digital as not just a new technique or medium, but a new way of thinking about cinema, offering a vantage point from which to reflect on the history of film. The origins of film technology, like the digitization of cinema, are hard to pinpoint, as they result from various technical developments over time. This article critically examines the period between 1998 and 2010, focusing on the establishment of digital formats in cinema production and distribution, including both technical and analytical perspectives.

Lioba Schlösser's exploration in *Diversity in Pixar Films: How Does CGI Influence the Diversity of Character Representation?* shows that the digital turn in the film industry has created new ways of representing characters in Pixar films. The author examines how CGI and digital production influence character traits, behaviors, and storylines, while also considering whether these CGI-created characters reflect social diversity and values. By analyzing *Toy Story* (1995), *Inside Out* (2015), and *Elemental* (2023), the chapter assesses the development of diversity in Pixar films and their representation in current productions.

In *Video Game Technologies in Post-Cinematic Imagery* Cyrill Miksch examines how technological methods and aesthetic practices from video game production have influenced contemporary post-cinematic filmmaking. Case studies such as *Cats*, *The Mandalorian* and *1899*, and virtual character creation, which contributed to the 2023 Hollywood actors' strike, illustrate this shift. The chapter argues that cinematic imagery has fundamentally changed since the digitalization of film and cinema.

Finally, Karina Pawlow examines in *TikTok's Duet Feature: Produsers Images in Political Contexts and Beyond* the TikTok's Duet feature as a participatory practice that adapts filmic tools for an amateur, user-generated video environment, with a focus on political communication. While there has been growing scholarly attention to political content

on TikTok, the app's visual dynamics have been underexplored in visual studies. By analyzing a video by Boris Johnson and four user-generated Duets, the article investigates the collective impact of users on imagery and reflects on TikTok's influence on cinematic image production and viewing.

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Grabbe, Lars C., Patrick Rupert-Kruse, and Norbert M. Schmitz. 2019. "Technobilder. Medialität, Multimodalität und Materialität in der Technosphäre." In *Bewegtbilder*, edited by Lars C. Grabbe, Patrick Rupert-Kruse, and Norbert M. Schmitz. Marburg: Büchner.

Transformational Digitality in Computer-Generated Aesthetics

Lars Christian Grabbe

Abstract

In recent decades, the focus of interaction and interface design has shifted from primarily visual and auditory aspects to exploring haptic and tactile potentials in media technology. This shift, described as "technogenesis," aligns technological structures with hapto-tactile sensory inputs, effectively embodying sensory perceptions within the media design. This has led to the creation of hyperaesthetic and cinematic images that transcend simple two-dimensional visuals, becoming multisensory experiences that engage users through synchronized tactile, haptic, and visual stimuli by movement and interaction. These hyperaesthetic images challenge traditional image theories, necessitating new analytical tools to explore their multimodal nature. The multisensory activation, termed "hyperaisthesis," results in hapto-tactile images that are interactive and integrated with the user's bodily perception. This development opens new possibilities for understanding image transformations and sensory media experiences, pushing the boundaries of visual and sensory engagement in cinematic (moving) image technologies.[1]

Keywords

Hyperaesthetics, excitation pattern, inter(re)activity, hapto-tactility, quasi-object, quasi-image, multimodality

1 This chapter is a revised version of "The Hyperaesthetics of Technology" published in Wagner, Christiane. 2019. *Art Style, Art & Culture International Magazine*, vol. 3, no. 3: 39–49, DOI: 10.5281/zenodo.4116486.

1. Hyperaisthesis

In recent years, a range of multimodal media technologies and prototypes have been developed, enabling a complex engagement with different sensory modalities. By focusing on sensory dynamics and perceptual states, both the scope of technology and the potential for reception have been expanded, resulting in innovative and sophisticated levels of immersion (cf. Biocca 1995) and presence (cf. Steuer 1995). Within the framework of immersion, vividness and interactivity play key roles in enhancing the effectiveness and efficiency of perception in virtual environments, as well as the communicative potential of sign-generating processes. Vividness refers to the multimodal engagement of various senses by a medium, while interactivity involves active mental and physical participation with a medium through the interface.

It is notable that developers are shifting their focus from primarily visual and auditory elements to exploring new and innovative ways of developing haptic media potentials (cf. Hjorth 2011, 445). This sensory shift has initiated what Hansen (2006, 9) terms "technogenesis," where the technological structure of media synchronizes with haptic and tactile perception. At the same time, these sensory inputs become embedded in the medium as design patterns.

Haptic and tactile perception, as fundamental aspects of an image, introduce new and innovative forms of media reception. This enhances media impact by providing information not only about the environment but also about the body's relation to objects, as Gibson (1966, 97) explains: "The individual gets information about both the environment and his [sic] body. He feels an object relative to the body and the body relative to an object." This kind of perception strengthens media engagement, allowing users to experience and evaluate inputs as if they were real (cf. Singer 2009; Roth 1997).

The concept of hapto-tactile media connects technology with the user's perceptual processes. This focus on the phenosemiotic media relationship (cf. Grabbe 2015), based on perception, technology, and sign dynamics, raises the theoretical question of how to identify the phenosemiotic structure of hapto-tactile media for systematic image theory. The hyperaesthetic image, part of interactive and hapto-tactile media, transcends the flat, two-dimensional surface, evolving into a multisensory quasi-object or excitation pattern. This transformation is

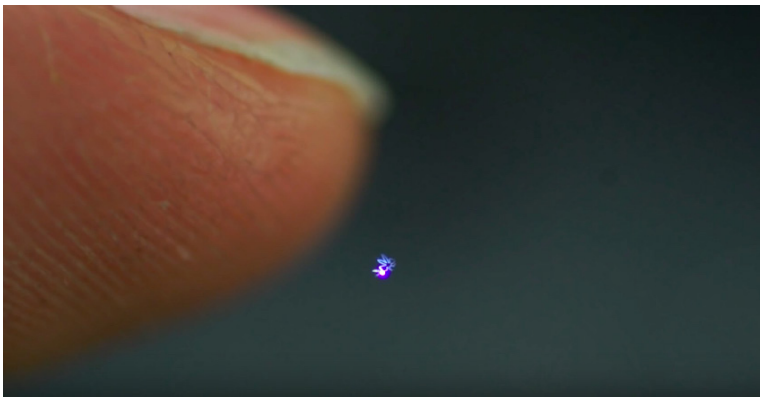

Figure 1: A femtosecond laser produces a dynamic aerial plasma graphic with the shape of a fairy, which can be touched without pain or negative effect (cf. Fairy Lights in Femtoseconds: Tangible Holographic Plasma [SIGGRAPH]); https://www.youtube.com/watch?v=AoWi10YVmfE.

driven by hyperaisthesis (υπεραισθησις), a sensory dynamic that surpasses the limitations of pure pictoriality. Hyperaisthesis is embedded within the image's technological framework and provokes a unique, boundary-crossing experience by synchronizing sensory perception, the user's body, and the sign-generating process.[2]

The following examples illustrate different forms of hyperaisthesis, highlighting the technology-driven elements in media reality. One notable case is the work of Yoichi Ochiai's research group at the University of Tsukuba, which explores holograms (as three-dimensional images) and volumetric displays. Using a femtosecond laser, they generate laser-induced plasma in the air to create volumetric images (Figure 1). This technique produces precisely controlled three-dimensional images, or voxels, in the air, structured as volumetric displays that can take various forms, such as fog, points, droplets, or floating particles.

2 The concept *hyperesthesia* is related to marketing and the consumer culture by the anthropologist David Howes to highlight the cultural consumption and the variety of products as elements of multisensory levels of meaning (cf. Howes 2004). In this article the concept will be used explicitly as an image-theoretical term to characterize the media potential of a multisensory influence on the perceptual reality of the recipient.

These images are referred to as aerial plasma graphics, which can be directly experienced through their haptic materiality—such as a small, touchable figure. The plasma generates pressure pulses upon contact (cf. Ochiai 2015), enabling a unique volumetric and hapto-tactile hyperaisthesis.

Takuji Narumi's research team at the University of Tokyo developed the MetaCookie+ system, which primarily enables a gustatory and olfactory hyperaisthesis, while simultaneously enhancing the haptic experience and influencing the proprioceptive perception of eating a specific cookie. The system alters the perceived taste of a cookie by "overlaying visual and olfactory information onto a real cookie with a special AR marker pattern. MetaCookie+ combines AR technology and olfactory display technology" (Narumi et al. 2011, 95).

The setup (Figure 2) consists of a head-mounted display, two cameras (for detecting the cookie and monitoring the eating process), an olfactory display (which uses an air-pressure system to deliver various scents), and a cookie printed with a QR code. When the user picks up the cookie, the first camera captures it, and as the hand moves the cookie closer to the mouth, the second camera engages to avoid blind spots. The QR code triggers a visual augmentation, such as a glaze or icing, applied to the cookie's surface (Figure 3). Simultaneously, the olfactory display releases scented air in front of the user's nose, corresponding to the type of glaze (e.g., a chocolate scent for chocolate glaze). As the cookie approaches the mouth, this haptic hyperaisthesis moment intensifies, and the scent becomes stronger, altering gustatory perception through a multimodal sensory experience (cf. Narumi et al. 2011).

Yasuaki Monnai's HaptoMime system, developed at the University of Tokyo, is a multimedia system composed of an infrared touch sensor in a screen-less frame, an aerial imaging plate (AIP), a liquid crystal display (LCD), and an ultrasonic phased array transducer. HaptoMime facilitates a hapto-tactile hyperaisthesis by enabling interaction with projected, hologram-like images that appear to float in midair. During user interaction, focused ultrasound generates tactile feedback through redirected acoustic radiation pressure. This creates a seamless visual perception of objects displayed on a "floating virtual screen" (Figure 4), accompanied by tactile input synchronized with the visual elements. As Monnai et al. (2014, 664) explain, "An ultrasonic

Figure 2: MetaCookie+ allows a multimodal addressing of the visual, olfactory and gustatory sense as well as a bodily-proprioceptive contact with the cookie (cf. MetaCookie at Exploratorium After Dark; https://www.youtube.com/watch?v=Oe39HQH78x4).

Figure 3: MetaCookie+ applies a virtual glaze on a cookie for creating a visual augmentation (cf. MetaCookie at Exploratorium After Dark; https://www.youtube.com/watch?v=Oe39HQH78x4).

phased array transducer delivers focused ultrasound onto the fingertip, creating a mechanical force that aligns with the position and timing of the floating image."

The exoskeleton developed by Dexmo Robotics enables the creation of quasi-haptic feedback in virtual environments. This means that Dexmo simulates the haptic sensation of an artifact's presence, such as its physical volume and spatial dimensions, generating a form of quasi-haptic hyperaisthesis. However, detailed information regarding surface conditions, texture, or material properties (such as mechanical strength or weight) cannot be conveyed (Figure 5).

> The force feedback function of Dexmo works as follows: when the user moves their hands and fingers around, the data is sent back to the upper computer which is converted into 3D graphics in a virtual space. The virtual hand moves with the user in real time. When a collision is detected between the virtual hand and an virtual object, a command is sent back to the device which activates the force feedback units. (Gu et al. 2016, 1992)

The Dexmo exoskeleton allows arm or grasping movements to be synchronized with virtual or immersive images, creating a coherent perceptual dynamic that connects physical and virtual presence. The intensity of this interaction is regulated by synchronized force feedback, which reinforces a clear sense of quasi-haptic hyperaisthesis.

> Just as a person's physical hand touches a real object, the object prevents the finger from moving inwards. The rigid exoskeleton exerts an opposing force to the user's finger tips, and thus provides the user with force feedback. (Gu et al. 2016, 1993)

Disney Research Pittsburgh's 3D-Tactile Rendering system produces a hapto-tactile hyperaisthesis that is synchronized with the display surface. This allows users to identify and touch depicted objects or their specific attributes, with the haptic or tactile response directly influenced by the movement of the arm, hand, or finger position (Figure 6). The system expands the traditional two-dimensional structure of static or screen images by integrating a multimodal synchronization between the displayed image and its tactile feedback. The tactile sensation is generated by the display's inherent capability, where electro-vibration serves as a feedback mechanism for the mechanoreceptors in the user's fingers.

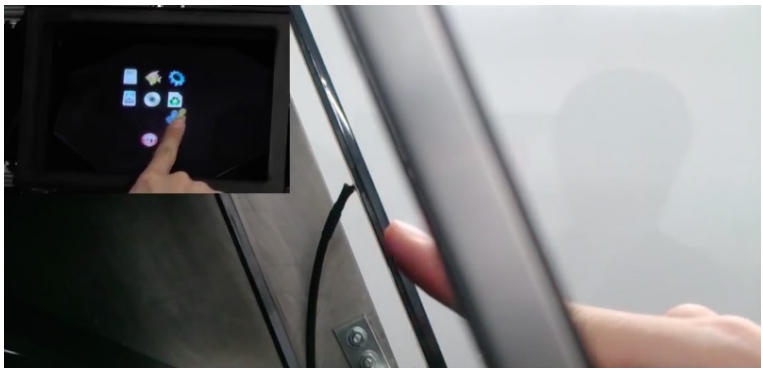

Figure 4: HaptoMime enables a tactile feedback of hologram-like depictions by means of focused ultrasound (cf. HaptoMime [full version]: Mid-air haptic interaction with a floating virtual screen; https://www.youtube.com/watch?v=uARGRlpCWg8).

Figure 5: With the exoskeleton of Dexmo Robotics it is possible to grasp virtual objects (cf. Dexmo: an exoskeleton for you to touch the digital world; https://www.youtube.com/watch?v=TPW5OKoc7dQ).

> The algorithm is based on an observation that the haptic perception of 3D features on flat surfaces depends predominantly on lateral forces applied on a finger. We formulate a perceptual model that relates the perceived strength of friction as a function of the voltage applied to a friction display. We then utilize this model to modulate the perceived friction levels and render differentiating tactile feedback for complex 3D objects; such as textures, facial features, 3D models, surface forms and topographies, etc. Although the proposed algorithm is applicable to all lateral force feedback devices, our development is based on electrovibration-based tactile feedback. (Kim et al. 2013, 532)

AIREAL, developed by Disney Research Pittsburgh, utilizes hapto-tactile hyperaisthesis with a focus on complex, proprioceptive engagement of the user's body. It functions as a multimedia force feedback system that harnesses surrounding air as the primary medium for delivering controlled, targeted feedback through air pressure (Figure 7). The air is compressed into vortex rings, which are synchronized with the user's body movements via gesture control, responding to spatial body movements and actions of the arms and hands. AIREAL reacts instantly, flexibly, and dynamically to the user's movements, enhancing their ability to influence virtual elements and respond naturally. The perceptual impact of the vortex rings allows users to interact with virtual inputs, such as hitting a volleyball in a game, and feel the virtual ball through haptic and tactile feedback.

> AIREAL is a novel haptic technology that delivers effective and expressive tactile sensations in free air, without requiring the user to wear a physical device. Combined with interactive computers graphics, AIREAL enables users to feel virtual 3D objects, experience free air textures and receive haptic feedback on gestures performed in free space. AIREAL relies on air vortex generation directed by an actuated flexible nozzle to provide effective tactile feedback with a 75 degrees field of view, and within an 8.5 cm resolution at 1 meter. AIREAL is a scalable, inexpensive and practical free air haptic technology that can be used in a broad range of applications, including gaming, mobile applications, and gesture interaction among many others. (Sodhi et al. 2013, 1).

The unique hyper-sensitivity of the media systems just discussed can be distinguished by their structural aspects of haptic and tactile experiences. This allows us to frequently describe these systems as hapto-tactile media hybrids. It appears clear that integrating pictorial, visual,

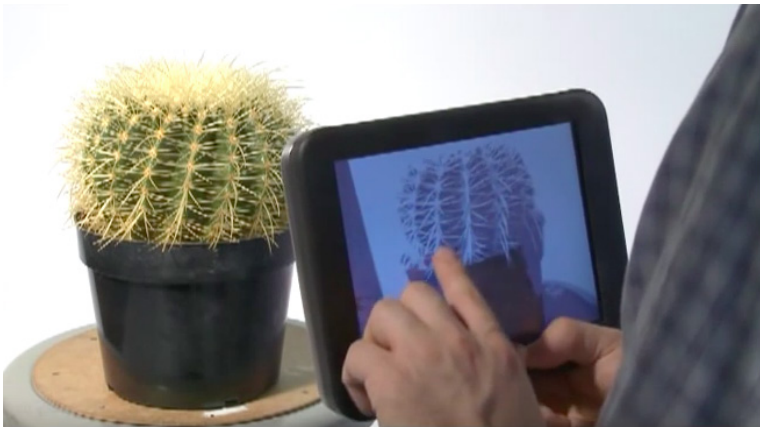

Figure 6: The 3D-Tactile Rendering of Disney Research Pittsburgh uses a display with electro vibration to enable a stimulus-driven force feedback (cf. Tactile Rendering of 3D Features on Touch Surfaces; https://www.youtube.com/watch?v=z01n5CyCKr0).

Figure 7: AIREAL of Disney Research uses compressed air for a tactile feedback (cf. AIREAL: Interactive Tactile Experiences in Free Air; https://www.youtube.com/watch?v=xaFBjUJj00M).

multimodal, and sensory dynamics is not an anomaly in media theory but rather a clearly defined objective for future media innovations and prototypes.

2. Haptic and Tactile Hyperaisthesis

The image and media theoretical analysis of actively grasping objects versus the more passive experience of being affected by an input reveal two distinct aspects of media technologies' hyper-sensitivity. These aspects frequently merge into a less clearly defined hapto-tactile media hybrid. Consequently, it is possible to differentiate between the active and passive user experiences of contact:[3]

> Tactile passive perception refers to stimulating the stationary finger or hand with a moving or static external stimulus whereas the term haptic perception is reserved for referring to the active exploration and manipulation of surfaces and objects with our hands. (Ballesteros and Heller 2008, 207).

Haptic perception involves a more intricate and active system, integrating inputs from various levels, including mechanoreceptors in the skin, muscles, tendons, and joints, and typically requires voluntary manual exploration of surfaces, objects, and their spatial arrangement (Leder-

3 The roots of the concepts haptic and tactility have very different meanings that do not necessarily correspond to the modern use of the concepts: Tactility reaches back to the latin *tactus* (touch, effect, influence, sense of touch or feeling) and *tactio* (contact, sense of touch and feeling). The infinitive and present tense *tangere* (*tango*; first person singular present tense active = I touch) stands for a broad conceptual range, like touch, mix, to touch with, cost, eat, drink, start, misappropriate, hit, enter, reach, border, stir, move, impress, mention, lead and cheat and is referred to the old Greek *tetagon* (τεταγων) (cf. Stowasser et al. 1998, 302–303). Tetagon (τεταγων) can be derived from the concepts moving or touching (cf. Gemoll 2006, 788). Haptic reaches back to the old Greek hapto (απτω) that has a complex semantic field: tack, attach, tie, take something up, stick, adhere, touch, record (cf. Gemoll 2006, 123). The concept haptos (απτος) refers to the concepts take and noticeable, whereby haptikos (απτικος) refers to the aspect that something is suitable for touch and hapteon (απτεον) means that it is a must to get in touch with something (Gemoll 2006, 123). With active meaning, but with a different stem is the old Greek concept pselaphao (ψηλαφαω) that refers to the aspect to touch something with a hand or to palpate and stroke (Gemoll 2006, 872).

man and Klatzky 2004, 107). The haptic system combines cutaneous information from the skin, kinesthetic movement sense, and cognitive control over subjective actions. In contrast, the tactile system is more passive, focusing solely on cutaneous information from the skin (cf. Loomis and Lederman 1984, 2). The relationship between haptics and tactility is complex, with systemic levels often blending together. Mark Paterson offers a detailed framework where haptics is seen as the primary and more complex modality, with other sensory levels dependent on it (cf. Paterson 2007).

1. Haptic: Relating to the sense of touch in all its forms, including those below.
2. Proprioception: Perception of the position, state and movement of the body and limbs in space. Includes cutaneous, kinaesthetic, and vestibular sensations.
    2.1. Vestibular: Pertaining to the perception of balance, head position, acceleration and deceleration. Information obtained from semi-circular canals in the inner ear.
    2.2. Kinaesthesia: The sensation of movement of body and limbs. Relating to sensations originating in muscles, tendons and joints.
    2.3. Cutaneous: Pertaining to the skin itself or the skin as a sense organ. Includes sensation of pressure, temperature and pain.
3. Tactile: Pertaining to the cutaneous sense, but more specifically the sensation of pressure (from mechanoreceptors) rather than temperature (thermoceptors) or pain (nociceptors).
4. Force Feedback: Relating to the mechanical production of information sensed by the human kinaesthetic system. Devices provide cutaneous and kinaesthetic feedback that usually correlates to the visual display (Paterson 2007, ix).

Paterson's framework is particularly insightful because it effectively integrates modern media technology with the concepts of haptics, tactility, and force feedback. According to Paterson, "Force feedback involves a combination of cutaneous mechanoreceptor sensation and kinaesthesia—essentially pressure and spatial movement for a measurable duration" (Paterson 2007, 133). Technology can directly address the tactile aspect of skin's sensory dynamics; for example, "force feedback in videogame controllers creates vibrations and 'rumble' using electric

motors" (Paterson 2007, 132) or employs "piezoelectric transducers in gloves to provide a sense of surface roughness or smoothness" (Sutcliffe 2003, 11). The goal of technological advancement is to accurately replicate media surfaces and textures as contact interfaces for tactile and haptic interactions. Although current texture development is limited, vibro-tactile stimulation provides defined and predictable contact experiences, as demonstrated by Disney Research Pittsburgh's 3D-Tactile Rendering. The complete simulation of realistic textures, finely tuned to the skin's functional dynamics and the intricate sensory nature of haptics, is still in its early stages. This is because the perception of surfaces and textures is embedded in a complex, multisensory framework rather than a single sensory structure:

> We shall contend not only that several disparate skin senses are involved, but also that the kinesthetic and proprioceptive systems which yield information about body motion and static bodily states, as well as hearing and vision, are deeply involved in the perception of texture obtained by touching a surface. The single tactile percept does not depend on the unaided operation of any one sensory system, but results from a widespread pattern of coordinated activities. We shall further contend that it is this multimodal nature of touching which gives touch the feeling of providing substance and reality to the perceived world. (Taylor et al. 1973, 261–262)

As observed, it is reasonable to emphasize the active dynamics of hyperaesthetic images in relation to their multimodal structure. From this viewpoint, we can conclude that hyperaisthesis transforms the traditional concept of images. A hyperaesthetic image engages haptic, tactile, or hapto-tactile input, allowing media technology to facilitate a physical or bodily experience of contact. In this touch experience, the recipient relates perceptual aspects of substance, form, and intensity to the depicted image artifact. During touch, the skin becomes an active, bodily interface, directly influencing design and technology. As de Kerckhove suggests, "the world as an extension of the skin is far more interesting than the world as an extension of the image" (de Kerckhove 1996, 345).

> The role of tactile extension is fundamental here because it is intimate. Tactility is involved with thought whether in our minds or in our machines, as a participant in the thinking process. Simulated tactility is the first psychotechnology powerful enough to yank us out of the literate, theoretical, frontal mindset. (de Kerckhove 1997, 45)

The concept of "teletactility" (Benthien 2001, 275), a structural aspect of hyperaesthetic images, is not simply linked to the skin and hand in a reductionistic way. Instead, it incorporates a sophisticated model of the human body, reflecting the complexity of the haptic sensory system. This concept is productively integrated with the technological innovations of postmodern telepresence.

> This is the topic among other things in the field of telepresence these days. With the help of telepresence, a soft form of telerobotic, we are able to deliver our image and its specializations among widespread networks and far distances. The computer-aided body exceeds the traditional and organic borders that are embedded in the skin. Our new skin is the terrestrial atmosphere that is sensitized through satellites.[4] (de Kerckhove 1996, 333)

3. Images as Inter(re)active Excitation Patterns

In analyzing and identifying the hyperaisthesis of images, it becomes evident that technological enhancements often play a significant role. For example, femtosecond lasers use aerial plasma graphics and volumetric voxels for image visualization, MetaCookie+ creates a virtual three-dimensional space through a head-mounted display, and HaptoMime stabilizes hologram-like floating images. Similarly, Dexmo Robotics, AIREAL, and Disney Research Pittsburgh's 3D-Tactile Rendering utilize displays for image visualization. All these media systems rely on computers for the precise creation of images, image artifacts, or hyperaesthetic quasi-images. Consequently, from an image-theoretical perspective, it is reasonable to associate the structure of hyperaesthetic images with computer-generated images, which often exhibit challenging typological distinctions. German media theorist Rainer Leschke

4 Original German quotation: "Darum geht es unter anderem bei dem heute nahezu alltäglich gewordenen Thema der Telepräsenz. Mit Hilfe der Telepräsenz, einer sanften Form der Telerobotik, sind wir in der Lage, unser Bild und seine Spezialisierungen über weitverzweigte Netze und sehr große Entfernungen zu verbreiten. Der computergestützte Körper überschreitet seine traditionellen, organisch in die Haut eingebetteten Grenzen. Unsere neue Haut ist die durch ihre Satelliten sensibilisierte Erdatmosphäre" (de Kerckhove 1996, 333).

proposes a triadic typology that differentiates computer images based on the depicted situation, the level of control, and the moment of active reception.

> The situational image is coded narratively, and it creates if not an impulse for interpretation still rudimentary structures of meaning. The control image is free of meaning but rule-oriented. The action image is not structurally a hybrid but mostly semantically motivated and simultaneously rule-oriented. This hybrid constellation generates a natural interface: Impulses for action and semantic motivation are synchronized and are structured analogue. The action image has a double ontology and the control and situational image are characterized by different ontologies, which embody the opposition of different knowledge systems regarding the screen and computer image." (Leschke 2014, 274)

Leschke's typology, while primarily focused on computer images and their interactive dynamics, provides valuable insights for a deeper understanding of hyperaesthetic images. His framework helps to contextualize the sensory dynamics of hyperaesthetic images by incorporating a situational context through a depicted situational image, a control dynamic within a depicted control image, and the integration of action stimuli and semantic motivation into the hapto-tactile hyperaisthesis, forming a hyperaesthetic action image. The concept of action here is linked to perceptual dynamics (where perception functions as a form of action with or on the image), allowing us to explore the relationship between hyperaisthesis and interactivity, and their impact on the structure of the action image. To further elucidate this relationship, we will refer to German media theorist Thomas Hensel and his conceptual model for computer images (cf. Hensel 2013). Hensel builds upon the conceptual and structural framework of Dominic Arsenault and Bernard Perron, who propose a modification of interactivity based on the causal and feedback-oriented dynamics between the gamer and the game world.

> The process of gameplay is usually intended from a gamer-centric perspective: A computer game is interactive because a gamer operates, and the game reacts on the input. Based on Tom Heaton's game play differentiation as 'units of interaction' Arsenault and Perron set the model of an interdependent reaction chain against the concept of a one-sided causality to focus on the reciprocity of gamer and game. In contrast to the traditional gamer-centric model this one is gamer-centric and game-centric—which

> prompted Arsenault and Perron to replace interactivity consequently with inter(re)activity.[5] (Hensel 2013, 219).

The interactive dynamic of hyperaesthetic images is maintained through an action-oriented input-output relationship, which is further regulated and controlled by sensory input dynamics. Thus, it is important to acknowledge a perceptual "inter(re)activity" (Arsenault and Perron 2009, 120) within the stimulus-response chain of media hyperaisthesis.

Building on Arsenault and Perron's insights and emphasizing the active use of computer images, Hensel introduces the concept of a double inter(re)active image act (cf. Hensel 2013, 226). According to Hensel, "computer images and computer game images are image acts (first-order performativity), essentially momentary creations that exist only in the present moment of their performance" (Hensel 2013, 226). This image act is reinforced by a triadic interdependency: the digital generation (codes of the digital image), the manipulability of the image surface, and the process of active reception, which occurs solely on the image surface.

> The computer image is a manifestation of a digital and operational code that undermines the separation of performance (action) and depiction (representation). The recipient executes something specific in using these images, which manifest for their part as image acts.[6] (Hensel 2013, 225)

It is particularly intriguing that the operational level of the image is shaped by the complexity of the underlying digital code. The reality of this code translates into the reality of the actions performed with or on

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5 Original German quotation: "Der in Rede stehende Prozess des Gameplay wird üblicherweise aus einer spielerzentrierten Perspektive gedacht: Ein Computerspiel sei interaktiv in dem Sinne, dass ein Spieler agiert und das Spiel auf diesen Input reagiert. Ausgehend von Tom Heatons Differenzierung des Gameplay in 'units of interaction' setzen Arsenault und Perron dem Konzept einseitiger Kausalität das Modell einer auf Wechselseitigkeit basierenden Reaktionskette ('chain of reactions') entgegen, in der sowohl Spieler wie auch Spiel aufeinander reagieren. Im Unterschied zu jenem traditionellen spielerzentrierten Modell ist dieses spieler-*und* spielzentriert—was Arsenault und Perron veranlasst, 'Interaktivität' konsequent durch das Konzept 'Inter(re)aktivität' zu ersetzen" (Hensel 2013, 219).

6 Original German quotation: "Das Computerbild ist demgemäß sichtbare Manifestation eines digitalen, operativen Codes, der die Trennung von Ausführung (Aktion) und Darstellung (Repräsentation) unterläuft. Man vollzieht etwas im Gebrauch dieser Bilder, die sich damit als Bildakte erweisen" (Hensel 2013, 225).

the image. The unique capability of computer games lies in their ability to merge cultural and algorithmic dimensions, enabling real-time inter(re)activity and various forms of gameplay (cf. Hensel 2013, 228).

By integrating Leschke's and Hensel's perspectives and applying them to the technological dynamics of hyperaesthetic images, we can delineate fundamental structural elements of image theory:

1. *Hyperaesthetic images* are inter(re)active images and the input consolidates a perceptual reaction based on sensory dynamic.
2. *Hyperaesthetic images* are determined by a double image act based on codes beneath the surface and actions on the operational surface of the image.
3. *Hyperaesthetic images* unfold the activity potential within a semantically motivated and rule-oriented *action image*.

Furthermore, we can conclude that image-theoretical elements must encompass the sensory and perceptual processes of hapto-tactile hyperaesthetic images to further clarify multisensory processing. The hyperaesthetic image goes beyond mere visibility, facilitating the synchronization of hapto-tactile feedback, depicted image objects (at the moment of performance), sensory stimulus processing, and the signification of meaning. This synchronization helps stabilize a coherent user perception by leveraging the medium's potential. Consequently, we can define expanded structural elements of image theory:

1. *Hyperaesthetic images* are determined by a triadic inter(re)activity because the performance (action) and depiction (representation) of the images are fully related to the haptic and tactile reality effect of the recipient.
2. *Hyperaesthetic images* unfold the activity potential within a semantic motivated and rule-oriented *action image* that transforms into an active *image excitation pattern*.
3. *Hyperaesthetic images* are quasi-objects because they get object-like attributes that can be physically experienced as if they were real.
4. *Hyperaesthetic images* are quasi-images because the object-like attributes transform the images into a physical form, appearance or body.

The triadic inter(re)active image excitation pattern introduces new challenges and opportunities in image and media theory, highlighting

the need to integrate sensory and perceptual dynamics into academic media discourse. Viewing images as technological excitation patterns requires a shift from traditional perspectives on images, visuality, and perception. This shift is necessary to develop analytical tools and new concepts for coherent characterization, analysis, and description. Clearly, the hyperaesthetic image represents a technological frontier that intersects structural image transformations, corporeality, and processes of signification.

4. Final Perspective: Cinematic Images

The moving image has always been both an image of movement and an image in motion, and over the last years, digital media technologies, communication strategies, and online distribution and streaming platforms have greatly enhanced its adaptability, interface access and mobility. Traditional concepts of cinema as a photographic technology, public projection, or specific creative work of an author or writer seem to be no longer sufficient to describe the diverse and globally circulating moving images of today, referring to a whole variety of media and image technologies. The term post-cinema still clings to the traditional notions of cinema. In contrast, the concept of the processual dynamics of film seeks to understand moving images through their technological operations and multimodal interfaces. This approach is necessary because it broadens the study of film beyond arts and aesthetics, while still recognizing its role in producing cultural meaning and social impact.

The cinematic image is an historical artefact that has transformed through the years and could be probably described best as a foundation of modern image technologies. It seems to be evident to understand the phenosemiotics of cinematic image as:

> … a series of moving image practices, including animation, digital effects cinema, video games and multi-screen art installations, that demonstrate how viewers must increasingly distribute their attention between diverse elements that interact within screen interfaces. Those diverse elements might include special effects and characters/material elements or multiple stories across split-screens. This distributed viewer attention … mirrors the

> way that we understand the world through diverse points of technological contact when we refract our experience of spaces through different media, screens, and technologies. (Kirby 2023, 7)

The digital aspect of modern cinematic images is highly evident for artistic work because they can fluidly be adapted to imagination. The digital image in the context of the cinematic image is highly symbolic or metaphorical, because each of the digital image elements "its immateriality, its non-indexicality, its endless capacity for transformation—has the potential to function as a metaphor within a film's wider epistemic structures and operations" (Purse 2013, 29). In this condition, the digital cinematic image becomes an open signifier, an arbitrary sign, that is endlessly dynamic and formable that opens the traditional film capacities in the context of computer-generated imagery in VR, AR or XR. It seems plausible to understand the cinematic image as a virtual mode of communication that enables an explicit transformability of the visual aesthetics by the use of computer-generated imagery (CGI), and therefore, "… the domain of digital visual effects has expanded with the development of new technologies and software" (Whissel 2014, 4).

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Thin Air and the Dispersed Screen

Jens Schröter

Abstract

It is a recurring motif in many science-fiction movies that has become a kind of signature for the future: highly advanced three-dimensional displays. The most significant trait of these fictitious displays is that it seems possible to project an image in thin air—without a screen. No such technology is currently known, but there might be a way that is in a way prefigured in drone imaging: If the screen becomes dispersed and a set of screen points, each of which carries an image point, then images in thin air could be realized. At the end of the chapter the reason behind the imaginary of a screenless image are shortly discussed.

Keywords

Drones, holography, image, imaginary, light, screen, three-dimensional image

There is a recurring motif in many science-fiction movies that has become a kind of signature for the future: highly advanced three-dimensional displays.

One very well-known example is *Avatar* (USA 2009, James Cameron), where the display has military functions. The human colonists want to obtain a rare substance from the moon on which the blue, alien, indigenous people live. The fictitious 3D display is a kind of round table, above which a colorful, translucent representation of the target area rises. The display combines realistic views of the target area with data and additional information, for example about the raw materials in the ground. The representation can be moved to make different places visible, and it can be zoomed in and out. Various male figures, some in civilian clothes, some in military attire, stand around the display and discuss the inconvenient fact that the village of the locals is located above the largest deposit of the sought-after substance. The idea is to force the locals to leave their home.

Another more recent example is *Blade Runner 2049* (USA 2017, Denis Villeneuve). The most prominent example of a highly advanced 3D display is the protagonist's virtual girlfriend "Joi" (Ana de Armas). She is a kind of partner to the protagonist (named "K"), a beautiful, "holographic" girl, who can appear in many different forms in real space, although she cannot be touched. She is somehow "projected" into the protagonist's apartment, and with the help of a so-called emanator she can even leave the building. The movie features many fictitious advertisements, appearing as gigantic images floating in thin air, for the fictitious company that sells these "holographic" companions.

As stated in a technical paper on an advanced display technology, to which I will return later:

> Free-space volumetric displays, or displays that create luminous image points in space, are the technology that most closely resembles the three-dimensional displays of popular fiction. Such displays are capable of producing images in 'thin air' that are visible from almost any direction …" (Smalley et al. 2018, 486)

The point of the fictitious displays in *Avatar* and *Blade Runner* (and many other movies) is that the images can seemingly be displayed *without a screen*. To come back to the example of Joi from *Blade Runner*, this character is said to be "projected." But how can her image appear

in thin air? What is she projected onto, exactly? We can compare this to the situation in cinema. There is a projector too, which emits a beam of light. This beam contains the images but is invisible in the air. The images only become visible when the beam hits a screen. To see the images, you can insert a screen into the beam at any point, be it a sheet of paper or a cloud of smoke (Schmidt 2011). But without a screen, no image can be seen. The fictitious images from science-fiction movies are the phantasm, it seems, of *images without a screen*.

A similar phantasm is enacted in the much-discussed live appearances of musicians like Tupac Shakur or ABBA as "holograms." These are in fact not holograms, but basically high-definition video projections. However, this is not the point I want to discuss here (Schröter 2024). What I want to emphasize is that, in these images, the screen also seemingly disappears in spite of the three-dimensional images appearing in thin air. Rather than a cinema-like situation in which the audience looks at a screen, the figures are presented as if they were live on a stage. Yet these images are video projections onto thin veils in front of the stage or—as in the case of ABBA—a very large high-definition video screen. This is hidden very well, e. g., by distracting lighting effects. The audience is basically sitting in front of a very large computer monitor. The concealment of the screen is nothing new, of course—if we return to the classic example of cinema, the screen always and inevitably disappears behind the projected images (Göttel 2017). But the phantasm in the images-hanging-in-thin-air is that there is no screen at all. In reality, even in the research on volumetric images, no technology is known today that can produce such images (Schröter 2014, 245–76)—with the exception of a few small first steps to which I will return later.

One might ask, and this is why I am using the term "phantasm" intentionally, what the reasons are for such a fantasy, reproduced again and again in popular science-fiction movies. Presumably, it is simply the usual ideological narrative of technological progress. Showing an image-forming process that is thought to be impossible today underlines the alterity of the future; obviously these new image-forming processes will require the discovery of new physical effects. The history of visual representation is modeled on a narrative of ever greater realism, the "myth of total cinema" (Bazin 2004).

There is another example of the relationship between image and screen that is worth mentioning here: the *virtual image* (Schröter

2021). The virtual image, at least as defined in optics, is an interesting case, since a virtual image cannot be projected onto a screen at the place where it seems to appear. A mirror image seems to show objects "behind" the surface of the mirror, but when you place a screen behind the mirror no image is formed:

> The most simple kind of imaging is performed by a plane mirror: The image position can be derived by geometrically mirroring the object at the plane of the mirror, which is then the plane of symmetry between the object and its image. The image thus created is a virtual image: If a screen is brought to its apparent position, the image will not be apparent on it. (Dorsel 2004, 1347)

Does this not show that there is at least the possibility of a separation of image and screen? Yes and no. Surely the virtual mirror image is separated from the screen in the sense that it cannot appear on it at its apparent place, but the surface of the mirror is a kind of reflective screen without which no mirror image would appear. The mirror image does not appear in thin air.

There is an unspoken assumption—perhaps derived from cinema—that the screen has to be two-dimensional.[1] In most of the actually existing 3D imaging technologies this is also true. In stereoscopic cinema, which experienced a major boost in 2009 with *Avatar*, two slightly disparate images are projected onto the same screen. Each eye receives the appropriate images, filtered through glasses, and a pseudo-three-dimensional impression emerges. Stereoscopic 3D is "pseudo" because it conveys an enhanced sense of depth, but the viewer cannot look around the depicted objects. And it presupposes a two-dimensional screen. Even in the often misunderstood medium of holography (e. g., the mistaking of the video images in recent ABBA performances for "holograms"), the screen remains two-dimensional. There is a holographic plate, which produces a real 3D image when lit with the correct light. This is not pseudo 3D, because it shows different aspects when watched from different angles. But it still presupposes a two-dimensional screen.

There are other cases, however, in which the difference between image and two-dimensional screen becomes problematic. Think of the case of sculpture. A sculpture can be seen as a 3D image (Winter,

1 Even if it is warped in the third dimension, e. g., in the case of a 360-degree cinema or a globe.

Schröter and Spies 2005). Yet it is simply a materially three-dimensional image; it is not projected. What is "screen" supposed to mean if there is no projection? In this sense, a sculpture is an image without a screen, because a sculptural representation is not projected (although it can be scaled and distorted in many ways in relation to its referent, if there is one). You could argue, though, that sculptures are images in which each image point coincides with a screen point. The sculptural image, in a fundamental sense, needs to be realized in its material, which is its screen. In sculpture it is no longer true that "the light scattering surface and the image point are physically separate" (Smalley et al. 2018, 486). The screen is materially warped and three-dimensional, as the image is. It is, however, possible to reproduce sculpture in other media such as photography. When this happens, the sculptural image is (only partially and approximately, of course) represented on another, two-dimensional screen. But this simply shows that the sculptural image is in principle different from its material screen (it can be represented two-dimensionally, although its spatiality can only be represented in a sequence of images). It therefore makes sense to describe a sculpture (as a three-dimensional object) as a three-dimensional screen that carries a three-dimensional image.

But if we accept that the screen does not necessarily have to be two-dimensional, a completely new option opens up: *The screen could have fewer dimensions*. One dimension would be a line, an interesting option I will not discuss here. The screen could also have zero dimensions (of course in an idealized way): This means that the screen is a set of screen points, each of which is correlated with its image points. The screen changes from a flat two-dimensional surface to a cloud of screen points. There is already a type of image technology that operates in this way: the *drone display* or *drone art* (Wikipedia 2024). Drone images are images in which a fleet of drones, coordinated by an appropriate computer program, flies in formation. Every drone carries a light, which may change in intensity and color.

The drones operate as screen points which carry an image point, allowing different images to be formed more or less in thin air (see Figure 1). At present, of course, drones are bulky, noisy, three-dimensional machines. But we can imagine that drones will become smaller and smaller, to the point where we can no longer identify single drones. If we coordinate them in the right way they could operate

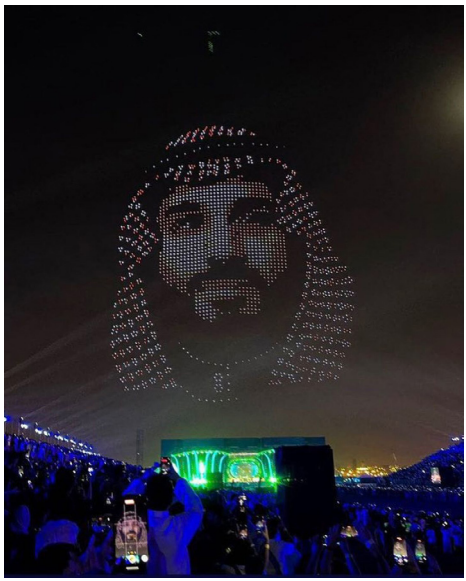

Figure 1: 2100-drone portrait of Mohammed bin Salman Al Saud performed by Geoscan Group at the Saud Riyadh Seasons 2021 (Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Riyadh_Seasons_2021_Drone_Show_performed_by_Geoscan_Group.jpg, https://vk.com/geoscan.aero?z=photo-95056764_457241489%2Fwall-95056764_2617, CC BY-SA 4.0, https://creativecommons.org/licenses/by-sa/4.0/deed.en, not altered).

as one-dimensional screen points, each carrying an image point, and form an image in thin air.

There is in fact a science-fiction movie that shows this kind of (of course, fictitious) technology: *Black Panther* (USA 2018, Ryan Coogler). *Black Panther* is not a science-fiction movie in the strict sense, but more an example of alternate history. Nevertheless, the technologically advanced African society of the fictitious state Wakanda has advanced 3D imaging technologies. Again, 3D imaging seems to be an unavoidable marker of futurity. These images, however, are not presented as light floating inexplicably in thin air, but as dispersed screens. They are composed of seemingly material particles capable of forming images, which are sculptural in appearance, opaque, moving and in full color.

This "diegetic prototype" (Kirby 2010) of a new way of imaging coincided with some real research on similar displays, produced in the same year. These belong to the class of volumetric displays, which have been explicitly compared to sculpture and its specific arrangement of image and screen points: "[A] volumetric display has image points that are co-located with light scattering (or absorbing and generating) surfaces. This subtle distinction highlights how the sculpture-like physicality of volumetric displays gives rise to their unique ability to present 'depth rather than depth cues'" (Smalley 2018, 486). Smalley and his co-authors list a few types of display that—in 2018—come close to the production of images in thin air. One of them is an interesting proposal for a volumetric display using dust as a screen:

> Currently, there is no form of display that allows objects to be imaged "in thin air." There are various forms of stereoscopic or holographic display which allow an observer's two eyes to perceive two different images, as long as the observer is looking into a display screen. There are also swept-screen volumetric displays, in which rapidly successive images are projected upon a physically rotating screen which repeatedly sweeps through a volume. In this case a volumetric image composed of points of light is directly formed in space, visible by multiple observers. The entire device needs to be enclosed in a transparent dome, for safety. Alternatively, some volumetric display devices employ two laser beams of different frequencies, focused into a cubic volume that is filled with a photo-responsive material. At any given moment, the material visibly glows at that point within the cube where the two laser beam foci meet. By optically scanning the two beams through this material, a volumetric image can be formed within the cube. But the display described [in the patent] is the first which enables the sort of scenario popularized by such films as *Forbidden Planet* and *Star Wars*. In the display devices posited in those movies, an animated figure is imaged directly in the air between them, with no need for a projection screen. (Perlin and Han 2006, column 1)

Here we find several motifs that are now commonplace: the role of cinematic representations of futuristic displays as diegetic prototypes; the problem of "thin air" and the absence of a projection screen. Moreover, the idea of a dispersed screen is made explicit here: "Preferably, the collimated light source is a laser. The optically transparent medium is preferably air. Preferably, the light-scattering medium is suspended dust" (ibid, column 2). In this concept, a monitoring beam detects a given particle and an optical beam illuminates the detected particle in

RGB (some particles in red, some in green, some in blue). Given the so-called persistence of vision, an image can be built up step by step—in thin air. Although this concept is different from the fictitious display in *Black Panther*, because it is still about lighting a particle (or a group of particles) with a beam, instead of particles emitting light themselves and forming an image, like a swarm of drones, it is a step towards images with a dispersed screen floating in thin air.

Such images, if they do exist one day, will presumably have the uses that are already prefigured in the movies discussed: They will allow the analysis and control of spatial regions (and will therefore find military, medical and scientific applications), or they will be used to attract attention in advertising. But in a way there is also a deeper fantasy here.

Lacan constantly emphasizes that the subject is in the "picture" (1998, 106). But the "picture" we are in is not two-dimensional. It is a three-dimensional scene, a three-dimensional image. Kaja Silverman argued that "the camera has been installed ever since the early nineteenth century as the primary trope through which the Western subject apprehends the gaze" (1996, 135). In light of the above discussion, we might ask whether this historicizing perspective allows for the emergence of new and perhaps more appropriate "primary tropes" for the gaze.

In a short section of *Seminar XI*, Lacan (ibid., 99–100) discusses Roger Caillois's (1984) influential reflections on mimicry. Caillois discussed the property of organisms, often noted in nature, of adapting to their background. In doing so, he departed from Darwin's concept of adaptation. Lacan, referring to Caillois, emphasizes approvingly: "Indeed, it is in this domain that the dimension by which the subject is to be inserted in the picture is presented" (1998, 99). Caillois (1984, 23), in his discussion of mimicry, speaks of "sculpture-photography or better *teleplasty*, if one strips the word of any metapsychical content." Caillois discusses a becoming-image of the animal through mimicry, and Lacan extends this to his idea of the becoming-image of the subject through the gaze. What, then, might be considered the "primary trope" of a contemporary "camera" that turns the subject into an image? Is it not the phantasmatic, screenless image hanging in thin air? If the image can exist without a screen, as a body among other bodies, does this not mean that everybody potentially becomes a picture (as is shown with Joi in *Blade Runner 2049*)? Is this not the final "myth of total cinema" (Bazin 2004)?

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The Precarious Contact Zone Between Post-cinematic Film and Its Environment. A Media Philosophical Perspective

Sebastian Lederle

Abstract

Film, as the chapter argues, can be found everywhere, can enter into open, intermedial as well as transcategorial affiliations with everything, and can multiply, contract, expand, change, and have a transforming effect on its cinematic as well as extra-filmic environment in an incalculable way. It is only when transforming, when affecting and being affected. This is also the case because the post-cinematically transformed film has become a spatially determined effect and operator in an excellent way. It is dispersed everywhere and is no longer fixed in time to a particular place. When it is uncertain where film will appear next, it bears a virtual presence for the extra-filmic world, even if film is literally absent at the moment. Film in post-cinema has a precarious status, because it is in need to constantly renegotiate the difference between film and non-film as a part of becoming-environmental and creating a filmic environment.

Keywords

Post-cinema, media ecology, media philosophy, precarity, spatial turn, environmentality

1. Introduction

This essay examines an aspect related to the status of film in the era of post-cinema from a media-philosophical perspective (see Engell and Voss 2022). It is based on the fundamental assumption that film in post-cinema follows a logic of spatialization in particular (see Bernin, Schulte, and Schwanecke 2014). Such logic is not meant to develop comprehensive conceptual systematics into which film could be integrated as an epistemic object. Rather, it is about a way of looking at film as an effect and operator of spatialization, which will be examined below, especially in terms of its media-ecological and precariousness-theoretical dimension. A media-ecological perspective on processes of precarization allows us to grasp these processes as medial and to ask what part precarity—understood as an ontological operation (see Engell and Siegert 2017, 79ff.)—plays in the emergence, transformation and evaporation of milieus, environments, atmospheres and surroundings. Space, in turn, plays a special role here, because after the spatial turn in cultural studies (see Bachmann-Medick 2016, 211–243; Günzel 2017), it has also increasingly led to new impulses in media studies, which revolve primarily around media-ecological issues.

In these contexts, space is not thought of as an empty container with a certain extent, but rather as an instance of affection, active-passive attributions and the emergence of relations, dependencies and entanglements that precede an epistemology and ontology oriented towards fixed and separated objects, because these are always already embedded in the milieus of their production and appropriation (see Voss 2015, Sprenger 2019). Space is thought of as spatialization: How do spaces arise in their affective, cognitive, surrounding, relational and emergent qualities and affording reliefs, in whose structure media are already immersed in and at work as co-agents? No space without spatialization, no spatialization without the collaboration of media. It is hardly surprising that film has played and continues to play a special role in the emergence of such media environments. What is less obvious, however, is the question of how film, in its heterogeneous diversity, orchestrates and helps to shape certain milieus (see Muhle 2022), when the focus shifts from temporality as the established parameter of classic cinema (see Doane 2002) to the dispersive and instable spatiality of post-cinema.

This does not mean, of course, that temporality no longer plays a significant role in how film is constituted in its various assemblages with other media, aesthetic valences, social actors, technical infrastructures and (micro)political practices. But to understand how the immanence of these assemblages arises—that is, the self-evidence and the afforded confirmation that media produce, sustain and expand with and in their environments—without simultaneously succumbing to it, requires the analytical category of space or space as an operator: Spatialization is always at play when the impression arises that everything that happens in the media, i. e., in film here, by means of time, is already inscribed in a spatial frame with no outside. No matter when a film is shot with a smartphone and shared on social media—for example, no matter how many reactions there are to it after only a couple of minutes, no matter how highly sequenced content is on Instagram or TikTok when scrolling, viewing, editing or sharing it with others—both the acceleration and shortening of the intervals of production, reception and circulation, as well as the possibility of distribution of content in (nearly) real time, point to a technical-apparative ubiquity of film as a medium, which leads to spatialization and thus to the environmentalization of actors, in which they become part of the autopoietic evidence machine of film in post-cinema. Where there is no outside to film, because the ubiquity of the camera, from smartphones to CCTV, has blurred the boundaries of filmability and thus tends to transform everything and everyone into a potential (post)cinematic scene, the spatialization of time is always running concurrently: Now is film, because it is already here. Becoming environmental through and in the media would therefore mean that—as a limes—complete synchrony is produced as an effect of spatialization. This is where the significance of ubiquity as an analytical category and the determination as a medial or cinematic operator lies. In the context of a film understood in this way, the following questions arise, among others: Is there a specific environmental aspect to film? If so, how can it be conceptualized? How does contemporary film operate as a medium and agent of milieus? Could film even be characterized as being the environmental medium par excellence?

The following remarks refer to the delimited mode of operation of film in post-cinema. But they have the development of a media-philosophical concept of precariousness as their vanishing point, which is not only about the representation of precarized social groups (see

Lorey 2012; Marchart 2013), but also about the extent to which the attribution of precariousness to social actors is co-determined by a specifically medial and technical process of being made precarious (see Lederle 2024). This means starting from an understanding of the precarious that is not exclusively focused on the social and political reasons for precarity, but rather in how the (self-)perception, representation and negotiation of precarity is only possible because it draws on self-addressing that is already informed by media operations and effects, which create instable and contested environments and modes of embedding.

Crucial for such a media-philosophical understanding of precarity is that the medial techniques of addressing have already become precarious themselves, and that precarity therefore does not arise only at the level of social ascription by others and self-attribution, but that mediality itself performs its work only as a positional, unstable, disruptive and contested one. How, and the fact that precarious social actors can relate to themselves as precarious at all, proves to be a medial transmission of precarity into the corresponding social and political practices of self-attribution. It is therefore suggested that precarity or precarization should also be understood as a concept relevant to media philosophy, for which its ubiquity, as will be shown, is characteristic as a mode of spatialization of precarity. The Latin word 'ubi' already points to the significance of the "where" question: What is film like if it can happen everywhere or nowhere at all (see Osborne 2013)? The relation in question then is no longer the one of what and why, but of how and where. In the long term, the concept of precarization should provide further insights into how film is embedded in various contexts in post-cinema and how the difference between film and non-film can be reconstructed in terms of milieu theory as a moment of processes of environmentalization.

It is argued that film both produces its own environment and is embedded in an environment that encompasses it. What is important here is that the embedding of film occurs through its very own collaboration and that film processes the difference between film and non-film in such a way that it does not allow film to be completely immanent, but rather repeatedly and precariously subjects it to the dynamics of self-undermining of its cinematic autopoiesis, which constantly and unpredictably changes and renegotiates what film is and can be. In the

considerations pursued here, the dimension of space plays a special role, because here the environmentalization of the cinematic, as formulated in media-ecological terms, can be vividly demonstrated. Where film takes place can only be understood if, with its respective occurrence, it makes clear that it could have occurred anywhere else. This is its ubiquity. In contrast to the cinema, there is no longer a fixed and limited place where it occurs and from which a temporal framework also emanates. The thesis here is that the dissolution of the spatial boundaries precedes the film-specific temporality, because only ubiquity, i. e., film being everywhere or nowhere at all, makes it possible to understand what it means that film, in varying degrees of realization and actualization, has a constant and uninterrupted duration resp. presence.

The spatiality is where the ubiquity of film manifests itself in a striking way: Film is only what it is to the extent that its spatial ubiquity decisively determines its temporal ubiquity in perception—film, as it seems, is everywhere, and it could not be any different. This immanence of film (see Hagener 2011), which seemingly knows no outside, reveals a hidden priority of space, which leads to the fact that the becoming of immanence can only be represented among its conditions being already in place. Because of this there is a tendency that the contingency of media and film operations becomes invisible. But to become aware of this contingency, something must be sought within this spatially dominated, film-immanent ubiquity that simultaneously produces and undermines this immanentization. Contingency must therefore be sought where it seems least likely to be found, namely in the constitution of the medium of film and thus in its autopoietic mode of operation (see Voss 2013, 217–223): What film intrinsically produces is the impression of reality or reality effect that is attributed to it, an impression of the highest liveliness and spontaneity because of its operation alone (see Koch 2016, 247–257). What you see on a screen, for example, does not look as if it is moving or alive by itself, but rather moves of its own accord if it is successfully accepted by an audience in this lively appearance (see Gotto and Lederle 2020, 7–33)

This acceptance by the audience is not an act of deception or trickery, but rather an immersive experience of the events on the screen. What is seen and heard is as if it could not be otherwise as it is seen and heard. The film itself produces its evidence and thus the invitation to authenticate it in its evidence. It is an autopoietic operation or agen-

cy. The media-philosophical hypothesis would then be as follows: The evidentiary and authenticating effects of film in post-cinema exist only to the extent that they undermine and question themselves, and in this sense, make themselves precarious. This points to the significance of the contact zone between film and non-film in view of the space-emphasizing ubiquity and immanence of film: If everything is already film, how exactly does film relate to its outside (see Fahle 2009), to the place or places where it is not or not yet? If it exists, what is the difference between 'not' and 'not yet,' and what significance does an outside of film possess, which is non-filmic, whose boundaries are pushed further and further back with each advance of film and, in the midst of the supposed ubiquity of film, create gaps, cause interruptions and puncture it at its autopoietic center—and ultimately lead to something like an entanglement of media economics and cinematic precarization?

2. Going to the Movies

The basic assumption made in this context is that the relevant question is no longer 'What is film?', but 'Where is film?' (see Sommer, Hediger, and Fahle 2011). It is about the change from an essentialist to a topographical or topological perspective. Film in the cinema dispositive used to be more or less clearly positioned and framed: Cinema films have a certain length, a fixed location and ensure a certain sequence of things to do and things to be addressed—you visit a building, buy tickets and snacks, adopt a certain sitting posture in the movie theater and look at the screen in the dark room. At the end of the movie, you get up and leave the theater. The distinction between movie and non-movie follows a clear sequence and a spatially fixed boundary. It usually clearly regulates the difference between film and non-film, since the question, where film is, can be answered by pointing at the movie shown at a specific place, the movie theater, at a specific time and under specific conditions, which all together constitute the praxis of 'going to the movies,' the limits of the medial operation, the projection of a film on the screen by a technical device, and the specific aesthetic experience watching a movie conveys (see Elsaesser 2012, 319–341; Elsaesser and Hagener 2015)

Speaking in contrast to the cinema dispositif, which one could name the post-cinema dispositif (see Hagener, Hediger, and Strohmaier 2016; Gotto and Lederle 2020), does not mean that cinema, going to the movies, no longer exists. It mainly emphasizes that cinema is no longer decisive for how and where film is received, produced and circulated. When movies are no longer exemplary, it does not mean that a certain other form of film is now representative of what film is and can be. Post-cinema means precisely that the modes of operation and appearance of film can no longer be understood through the ontological or essentialist question of what film is. What it means for someone to be engaged with film is no longer solely orientated at the cinematic form of movies but has to reflect on the different modes of how, when, where and by whom films are produced, altered, kept in circulation and received.

3. Cinematic Autopoiesis

But if the orientation to an excellent mode of production, distribution and reception of film is given up, then the normative possibility of deciding in general and in the abstract, what can be called a film no longer exists either. There are no longer any external criteria by which a film could be characterized as a film, but rather what makes a film depends entirely on how and in what contexts it appears as a film, is addressed as such and combined with other media and arts or is set in contrast to them. What film is, is a question that can only be answered by film itself, that is, by how it always already operates as film. However, since film is already presupposed as an independent medial agent when it comes to the question of film, the answer must be based on how and to what extent film can be understood as specific form of operative autopoiesis. The question then should be how film emerges and comes to be as a medium that works only as the medium that it is, as long as it sets itself already as the condition under which it operates. Film creates its own conditions, which are already a part of what it means to be a film, because they are not only enabling film to operate in a pragmatic sense—there must be a room, a screen, a projector, dimmed light, etc.—but they are already set in motion by what they set

in motion. The autopoietic structure of film creates an environment, in which it can affect the actors (audience, users) situated in it.

This concerns film not only as a clearly definable medium that can be distinguished from others, as is the case with the film in movie theater, which is determined precisely by a singular, closed and identically repeatable screening, which also predetermines how an audience relates to it afterwards or in anticipation. In cinema, too, film is autopoietic in the sense that its projection on a screen by means of a technical apparatus cannot be traced back to anything else, but is an emergent effect of a mode of operation. What appears on the screen is the film in its vivid impressiveness on the audience—and not something literally behind the screen or in the mere imagination of the viewers. The film is real as film only as long as and insofar as it produces itself through the operation of the projection device. It is effect and event at the same time: effect of an apparatus that produces a light projection, event because what can be seen on the screen would not be visible without the apparatus, but its impression of reality does not derive from it; it is something that is only brought about by the emergence of the film itself. In the cinema, however, there is a clear beginning and a definite end to the screening. What changes in post-cinema is not least the autopoietic character of film, which can no longer be understood as immersion into a closed projection on a screen in front of the audience but must instead be produced and asserted as film again and again under changing conditions, which are at the same time conditions that are set by film and conditions set for film. What is of particular interest is the contact zone, in which an area, where film is not present at the moment shifts to a proto-film area or transforms into a staging ground for film in the sense that being filmed is already anticipated in the way this area is built or designed.

Film in post-cinema eludes any kind of essentialism looking for clear cut criteria, which would allow one to distinguish between what is film and what is not. Film in post-cinema has become, as has been indicated, ubiquitous. There is no essence to which film can be pinned down, no certain conceptual space within which film is only what it is. Film becomes unbounded at the moment in which the difference between film and non-film is no longer based on the model of a movie. Film in post-cinema can be found everywhere, can enter into open, intermedial and transcategorial affiliations with everything and can

multiply, contract, expand, change and have a transformative effect on its cinematic and extra-cinematic environment. It is in this sense post-cinematic. The use of the words 'everywhere' and 'everything' may seem vague at first glance, but it is due to the ubiquity of film and the challenges it poses for a merely conceptual-discursive way of thinking of it. This difficulty rests in the phenomenon itself: Film has become precarious by expansion and vice versa. It has become unclear what it is, because the way it operates in post-cinema is exactly in a precarious state. The autopoietic character of film is no longer a stable process situated in a closed context, in which it appears like in movie theaters. The very existence of film and its meaning are rather contested and do not rest on solid foundations. The emergence of film as a merely autopoietic agent does not consider that in order to understand how film transforms a non-film area into a proto-film area or even a staging area for film, one has to see the power of film to create its own environments a contingent and instable one—even if film itself creates its own immanence and gravitation. Therefore, the thinking of film has to reset and reflect on this transformation by abandoning not only a what-is account, but also the idea that film is a stable, given effect of its self-fashioning alone.

4. Environmental Precarity of Film

If the difference between film and non-film is no longer categorical, but is itself subject to unstable, changeable processes of negotiation, this does not mean that this difference itself has become void. It is only in the way it arises, takes on a concrete form and is experienced as binding or changeable that it is already part of a film autopoiesis that has become precarious, according to the thesis pursued here: Where and when film is no longer refers to the reality effect of film alone, which tends to place it under the conditions of its own immanence, but rather how this tendency of immanentization, that is, the production of a completely film-shaped environment, undermines and questions itself.

In this sense, we should speak here of a precarious, inherently fragile mode of operation of film, which points to an outside that film has not produced alone, but that it must presuppose— and herein

lies its post-cinematic paradoxical constitution—to be able to exist as film. Seen in this way, film is always already out of place, outside, and changes to the extent that it repeatedly fails to integrate the outside of the film as an autopoietic outside and to fully subject it to film-shaped conditions. In other words, the question of when and where film is has become a question of when and where film is at all. It has migrated into the structure of the (post-)cinematic itself and, because the conditions under which film is, emerges, circulates and is addressed, have to be negotiated by this film in an openly precarious way. They cannot be delegated to other media, artistic, political or social instances. At the same time, however, they cannot be absorbed into the autopoiesis of film, because the necessity of negotiating them in a cinematic way is precisely what undermines, repeatedly disrupts and interrupts the autopoietic structure of self-positing and thus makes the creation of an environment by film precarious: Conversely, film is also part of an environment in which it is situated and to which it belongs, without being able to make this environment its own. There is, as one could put it, no reverse engineering of the embeddedness of film in a one-sided film environment.

It can therefore be said that the precarization of film as its own mode of operation makes it possible to pay more attention to the environmental character of media in general (see Löffler, Sprenger 2016; Hörl 2019). For this is not so much about the mutual influence of clearly distinguishable agents, but rather about the entanglement and various relations in which film already exists with others. In this respect, film is an affective and gradual variable, because its power to produce environments is always thwarted by becoming a part of a non-cinematic environment (see Voss 2015; Fahle 2023).

To the extent that film can place or immerse others in it, it affects them and works like a film. If film succeeds in placing such an area in its perspective, then one can speak of an environmentalization of film. However, since this also means that film must constantly go out of itself and transcend itself, there is no fixed center called film around which a proto-filmic environment can be prearranged. Whenever film extracts an environment from an area that is initially indifferent to film, it has changed itself in an unforeseeable way as film. Transforming a non-film-space into a proto-film area and thus opening it up to the mentioned contact zone, means film already had to invest in becoming

acceptable to an area where it has not yet been. This kind of investment indicates a permeable relation between the area of film and non-film. It has been transformed and displaced by its new environment, that is, film has also been environmentalized: It has become part of an environment towards which it has in turn moved. This movement can be called precarious, because it has no fixed direction or outcome, since it is only there as a risked one, as a force of de-stabilization and affection.

In summary, it can be said that film has a precarious status because it has to negotiate the conditions under which it can be and become film at all as its conditions, without being able to redirect them completely autopoietically. The status of film is precarious in a reflexive sense, since the attribution of the status does not come about without film having a say in it and in this respect, it participates in its own precarization. The zone in which precarious autopoiesis operates is indeterminate and volatile, since it cannot be determined where and when film intervenes in it and destabilizes it in one go. To avoid an essentialist suggestion when speaking of film, it is worth considering whether one could instead speak of the precarious status of the (post) cinematic amid the environments it generates and which in turn leads to a constant re-embedding into closer surroundings, milieus and environments of a larger scale. Overall, a connection between media ecology and precarization can be formulated that consists of the reciprocal movement of becoming-environmental and making environmental, in which both film is respectively integrated and which act through it as a medium of precarization (see Lederle, Seifert, and Siegler, 1–43). Without film, no specific cinematic milieu arises that would place the individual elements in a particular atmosphere and cast them in a particular light. Conversely, without a film-encompassing milieu, there is no non-filmic contact zone that accommodates the film or towards which it can move. Environment and film affect each other reciprocally, leading to an unforeseeable shifting, dissolution of boundaries, opening and dispersion of the contact zone between film and non-film. To speak of the precarious status of the (post)cinematic is therefore not empty nominalism, but rather an attempt to take into account the destructuring effects that occur when film and non-film meet and incalculable motion profiles and aggregations emerge, which expand and contract the film, maximize and minimize, disseminate and concentrate, fray and seal, accumulate and linearize, shut down and accel-

erate, temporalize and spatialize, transmedially enrich and aesthetically thwart it.

Film and non-film can of course be distinguished conceptually, but only occur in concrete mixtures, intersections and involvements with each other (see Voss 2023). What is important for understanding is to make film and non-film visible as relata of a relation and instances of a spatial embedding. The encompassing dimension of space is not a neutral container or a definable epistemic object but can be structured around parameters as such as affection, intensity and extension—and precarity. To illustrate the above with an example, the following section will explore the connection between film, milieu and precarization using TikTok.

5. Being On, Being Out of and Being in TikTok

Instead of the usual 90 minutes of a movie, the time of the film is spread indeterminately over the day or the week, for example, until it reaches the limit of being limitless everywhere. This is the case because the post-cinematically transformed film has become an especially spatially determined effect and operator. The ubiquity of film in post-cinema encompasses space and time in a much more dispersive, immanent and affective way than the classic two-dimensional projection on screen (see Gotto 2022, 71–89). It depends on how often you take, for example your smartphone out of your pocket while waiting for the bus to watch a TikTok video, how often you switch from your email program to YouTube on your laptop, how often you walk past a display in the city center etc. Ubiquity means that the question of when you are on TikTok becomes less important because it begins to matter that one remains on TikTok as long as possible and there are as many opportunities to reenter it as possible. In short: to be with and on TikTok everywhere. It is not uncommon to be horrified by the sheer duration of time spent on TikTok in only one day, especially when considering that a single TikTok is in most cases no longer than a snippet lasting 90 seconds.

Since access to TikTok is via smartphone, it can be used almost anytime and anywhere. TikTok is constantly present in the background

even when it is not currently being used. This of course also applies to many other social media platforms. But TikTok is of particular interest here because the brevity of interaction is an essential part of TikTok's design and interface (see Otto 2023). Videos that only last a couple of seconds are presented and follow each other in a high frequence. Many single short videos combine to a long stream, creating a spatial, e. g., environmental, immanence. One can reenter this streaming immanence any time from everywhere easily via smartphone. Due to its in this sense uninterrupted intermittence (see Otto 2014, 2015), TikTok is present in the everyday lives of its users in a diffuse, vague, indeterminate way. It is both part of the environments in which TikTok users spend their time, and an environment created by TikTok, in which users are immersed and which makes certain actions, views and evaluations of its users more likely than others—not as a causal effect, but as a mimetic self-addressing and self-representation of users on TikTok and beyond, guided by the TikTok milieu.

The shorter the individual videos become, the more endless the time spent watching them seems. Serial viewing of highly compressed TikTok videos becomes a cumulative overall process in which a specific immersive microenvironment is created, consisting of repetitive techniques such as scrolling and typing with the thumb, focusing a rather motionless gaze on a smartphone display, and a non-stop, short-interval sequence of suggested content (see Anikina 2022). This micro-milieu is precarious because it can collapse at any time and disappear without a trace, just as it has emerged. The individual snippets often have little or no meaningful connection other than that they follow one another in a contingent way from the user's point of view. The serial link maintains itself in a basal way and owes its continued existence to the simple fact that users are afforded to remain on TikTok by actively keeping the streaming immanence going. Immersion in TikTok is therefore only partially a contemplative one but requires active participation in the continuation of the micro-milieu and in maintaining the specific flow experience.

One could say that users affect themselves through their active immersion in TikTok and thereby medialize themselves in a precarious way. This is because users' collaboration in creating and maintaining the stream-immanent environmentality that is relevant for TikTok already takes place under the conditions that the platform itself sets and

defines. The way users are addressed and designed by TikTok consists in creating the impression that users' collaboration is the sole and decisive activity on the platform. On the one hand, the media participation in self-addressing is obscured by the users' participation, which is declared as the sole activity. On the other hand, thanks to the users' participation, TikTok succeeds in creating a TikTok-shaped environment that not only, but also, outside of explicit media immersion, leads to a performative imitation of TikTok content, such as certain facial expressions, slogans or movements, which are staged in squares or malls, for example. Conversely, TikTok in turn becomes part of an environment that not only permeates but is also embedded in and moves towards non-TikTok-area by means of adaptive, mimetic, creative acts. These performances belong in the contact zone of film and non-film because a proto-filmic realm emerges in which TikTok possesses a transmedial power of affection. However, this also depends on users becoming active as actors and interpreting their adaptive performances as part of a TikTok environment, which they, as actors, have not created, but see as already affording and surrounding them. TikTok itself can also become part of an environment as soon as the actors loosen or completely sever their ties to the TikTok-specific environment and enter into contact zones with other cinematic or non-cinematic, media or non-media environments. It may of course be that actions, habitus and performances have already been affordanced by TikTok and thus continue to influence how different environments establish their contact zones.

However, these are then embedded anew and differently in the respective other environmental settings, so that it is no longer a matter of a linear tracing back of such TikTok performance effects, but rather of the way in which they are amalgamated, mixed and constellated in changing environmental-actor relations, which as such do not result in a coherent and unified whole. TikTok intervenes in a non-filmic world through its transmission of collaboration in the activity of users, making it its environment by being latently present in it and in this sense ubiquitous. However, precisely because it is entirely up to the users how they interact with TikTok, it is always up to them whether and to what extent they allow themselves to be affected and regulated by TikTok's appeals to environmentalization and acceptance. Finally, a user can technically leave TikTok completely, so that the latent precariousness of TikTok transmission becomes manifest; thus the outreach

of TikTok is measured by how likely it is that someone becomes re-involved in TikTok again. If so, TikTok proves to be ubiquitous once again: It seems to be everywhere and every action seems to be, however remotely and vaguely, affected by it. The contingency of the power of TikTok affections becomes invisible and its evidence appears to be without any alternative: Everywhere or nowhere at all. It is then only an interval or an episode of TikTok absence in a sequence of being on and being out of TikTok, which is environmentally embedded by being-in-TikTok.

Film in post-cinema temporarily gathers world into the event and into the perspective of its concrete manifestation. If this happens in such a way that this process of gathering centers its participants completely around a certain occurrence of film, it becomes immanent and its environmental ubiquity suggests that it is without alternative. No matter how short a TikTok video actually is, for its duration, film occurs as part of a spatial setting between viewer, display and location, that exists only as long and insofar it creates an immersion, in which users and their possible actions become environmentalized. It is indeterminate how long these episodes and intervals last and where they occur, but, as part of the ubiquity of film, they can happen everywhere and all the time. There is no definitive exit to pass through to be completely out of touch. The notion of ubiquity tries to address this issue of expansive and contractive environmentalization.

6. World-Making Effect of Film

In post-cinema there is no longer a privileged place where film occurs in a representative and exemplary fashion. Film as an event and effect of creating precarious surroundings can happen anywhere. In this sense, film in post cinema is dispersed. This also means that the post-cinematic environmentalization takes the place of a heterotopic spatiality, which used to be attributed to the cinema film (see Cassetti 2010). One is not transported into another space, a so-called heteros topos, when watching a movie. If a streaming immanence like the one of TikTok can appear everywhere, if there is nothing that cannot be conditioned by the (post)cinematic, then film is not the heterotopia to

mundane reality, but the very forming agent of this mundane reality, into which it can insert itself ubiquitously. The reality shows an affinity towards film to exactly the grade it is already affected by its ubiquity: It does not have to be everywhere at once, but its effect consists in involving literally every place as its surroundings and scence. There is no non-environment, but only a certain relationship between becoming-environmental and environmentalizing, which in turn contains a certain relationship between film and non-film. One could say that film is in a competitive relationship with other media environments and the world as its virtual environment. In view of the competitive or contested character of the processes and effects of environmentalization, it could be considered whether one could also speak of (micro) political actions of counter-environmentalization. At this point, however, this can only be raised as a possible question.

The cinema film, movies, gathers the audience in a heterotopia, which is neither the screen nor the movie theater itself, but the objective illusion of movement that evokes a joint attention of the audience. In post-cinema, the immanence of film, its ubiquity and dispersion, becomes apparent: It does not move spectators to another place, but makes it clear through its appearance that everything can become the time and place of film and its conditions. Everything can be affected and set in motion by film. The operativity of film in post-cinema does not consist in establishing a new autopoietic center called post cinema, but in showing that virtually everything can be involved in film as soon as and insofar as the film happens and draws the world into it as its environment. In this sense the world-making capacity (see Schmidt 2011; Purse 2013, 129–152) of film in post-cinema has even become more powerful and expansive than cinema in the narrow sense of a film exclusively shown in a movie theater. At the same time the ubiquity of film in post-cinema places it in a competitive pluralism of environments of diverse types and forms, rendering it precarious: Everywhere, but where exactly and how the (post)cinematic is open to negotiation.

To understand the world-making effect of film—making world the environment of film and making it a part of the reality effect of film—a de-localized conception of space is assumed, which horizontally registers all places where film can and could manifest itself. If, in principle, a film could appear anywhere, this does not mean that this must always be the case. However, it does mean that the presence of the film im-

plies a virtual filmability of everything, since it is virtually everywhere. The film event puts the area in which it was not yet present into a protofilmic state. Creating a post-cinematic world means to articulate a world as an unfinishable movement of displacement; it is a world of creating affinities, inclinations, affections and involvement. Film, on the other hand, also produces its outside and thus simultaneously places this outside under conditions that are neither identical with film but undermine any clear demarcation. Therefore, paradoxically the power of the film to assert itself and create an immanence, in which film transforms everything into its environment, undermines itself, because it cannot finish the business of transformation. The movement that film itself is produces an unstable co-presence with that which it is not, with where it is not.

When and if film in post-cinema appears and is recognized as film, it spatializes its surroundings by performatively producing its immanence: Nowhere else but right now and here is film—but while it is here and now, it could virtually be anywhere else—and in a certain sense it is, because it is not possible to establish unequivocally its non-existence, but only the respective absence of the filmic event.

7. A Question of Status: Whose Precarity is (Re)Presented?

If, as argued at the beginning, the status of film in post-cinema is a precarious one, this also applies to the way in which actors address and present themselves as actors by means of film. The brief digression into TikTok should make this more plausible. Therefore, the question of who presents themselves and how, and who is even able to be appellated by the film and become an part of a post-cinematic environment, should be briefly addressed in conclusion.

Connected to this is the question of the status of political representation: What or who exactly is represented when precarity is not only ascribed to a limited social group of political actors, but running through all our lives in various degrees, different shades and having sometimes seemingly incomparable impact on them? Why is it not

theoretically sufficient or politically irresponsible to think, simply to present one's own precarity would already be enough in a medium such as film? Would that not buy into the immanence of film and cover how film has already become precarious in its operations? But then again: Without any kind of making precarity appear in the world, it would go unnoticed and unwitnessed in the blink of an eye. Who counts as precarious is linked to procedures of making it known, making it a matter of wider public interest and making it matter in the first place. And that means: Making it matter through the capacity of media and film to disenclose and collaborate with a world as an instable environment.

The precarious ubiquity of film in post-cinema corresponds with the task of showing precarity without absorbing it in a mere show of precarity. The knowledge of the status of being precarious itself is also precarious from the very beginning, since there is no logic of representational order in place that would allow us to decide for sure what one's showing of precarity ultimately would mean, stand for or how it best is put on display. What emergences or appears precarious would not be fully transparent or given in plain sight as precarious. The attribution of precarity is always already called into question and therefore contested by many different actors, agents, affections and effects

The spatial aspect to this ubiquity ties, as it seems, filmic precarity and other social, cultural, racialized, economic et alt forms of precarity together. How do I know about, how do I feel about my precarity or the precarity of a group I belong to? Or the precarity of others? In a way it has to be performed and made known, simply because it eludes the logic of representation and therefore cannot be fully made visible in this order. Post-cinematic film involves, affects and incites precarious acts, because it is the medium in which precarious bodies, minds and lives can appear as precarious—without referring to it as an epistemic, controllable object. This points to the mentioned paradox, which being precarious addresses: a status of permanent undermining itself. Film, as the article argued, is never fully present as in coming to a closure, reaching a status which cannot be called into question. There is therefore reason to suspect that marginalized groups also turn to media such as film, which have a precarious mode of operation built into them, and which seem to be suited to representing precarious conditions—not least because they are already in a media-ecological space that expands and contracts in an uncontrollable way and can therefore

affect actors in an unforeseeable way who have not yet been confronted with any status issues. This confrontation can set in motion different vectors: One can be on the way to gaining a certain status (at all) and one can be set on a path to losing a status, which calls for the resp. into question, what having (had) a status at all means. To close with a variation of Spivak's famous question: Can the subaltern film? This entails at least the two following questions. The question of politics and representation: Who has the means to produce films and can become a part of a movie? And the question of the political: Who counts and appears at all in different settings? Which kind of modes of post-cinematic operations create a contact zone, which can show precarity in a way that it does not reproduce the blind spots of representation, but exposes that which is hidden, missing, fleeting and notoriously elsewhere: Moving images in post-cinema reflect and produce a state of ubiquitously being displaced.

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Pixel vs. Grain. Historical Reflections on the First Decade of the Digital Roll-Out of Film production and distribution (1998–2010)

Marcus Stiglegger

Abstract

"The digital is not only a new technique of post-production work and a new delivery system or storage medium," Thomas Elsaesser writes, "it is the new horizon of thinking about cinema, which also means it gives a vantage point from beyond the horizon, so that we can … look back to where we actually are and how we arrived there." This 'look back' is associated with some complications for the medium of film, because ultimately it is difficult to identify a moment of birth for film technology. Siegfried Zielinski points out that from the beginning an alternating effect of different technical impulses and inventions led to the formation of the medium at the end of the 19th century. It is equally difficult to pin down an exact date for the digitization of cinema. This article will take a critical look back at the significant historical situation of the establishing of digital formats in cinema production and distribution—between 1998 and 2010—to understand the historical process that lead to the current state of the medium. The following article will include technical aspects as well as analytical perspectives of certain film productions of that time.

Keywords

High definition cinema, digital roll-out, film distribution, postproduction, CGI, pixel, grain, home media

1. The Digital Revolution

Only those who know history
understand the present.
Knut Hickethier (In Hickethier, ed., 1989, 7)

"The digital is not only a new technique of post-production work and a new delivery system or storage medium," Thomas Elsaesser (1998, 204f.) writes, "it is the new horizon of thinking about cinema, which also means it gives a vantage point from beyond the horizon, so that we can … look back to where we actually are and how we arrived there." Looking back, as Elsaesser says, is associated with a number of complications for the medium of film, as it is ultimately difficult to identify a moment of birth for film technology. Siegfried Zielinski points out (Zielinski 1994, 52) that from the very beginning, an alternating effect of different technical impulses and inventions led to the formation of the medium at the end of the 19th century. It is equally difficult to pinpoint an exact point in time for the digitalization of cinema. Rather, this process of digitalization is a lengthy process that already had significant precursors in the 1980s, until first post-production, then production and finally distribution were—and still are—converted to digital high definition format, because the final step towards high definition cinema in particular is still far from complete.

If virtual reality began with the early attempts at an internet (know as 'arpanet') in the 1970s, the arrival of digital technology in commercial feature films can be clearly identified: Almost as expected, it was the great visionary of American cinema Francis Ford Coppola who announced the digital revolution in the film business at the Oscars on 9 April 1979: "We are on the eve of something that is going to make the Industrial Revolution look like a small out-of-town tryout. I can see a communications-revolution that is about movies and art and music and digital electronics and satellites, but above all, human talent—and it is going to make the masters of the cinema, from whom we have inherited this business, believe things they would have thought impossible' (Hoffmann 1990, 125). What he actually anticipated with this statement he was initially unable to successfully realize himself. He simulated the Las Vegas location for his film melodrama *One From the Heart* (1982) with great technical effort in order to prove his theories. In an unusual process, he anticipated all the work steps that are

commonplace today: from the duplication of the most diverse script variants to the elaborate computer processing of individual shots.

In the same year, Walt Disney's science fiction production *Tron* (1982) was the first to refer to adventures in a virtual world and extensively combined computer graphics with real film shots. This was followed by the B-movie *The Last Starfighter* (1984) by Nick Castle, in which the spacecraft were produced digitally and thus temporarily replaced the miniature models that had previously been the basis for space effects. Otherwise, the format of the music video clip was primarily used to experiment with computer-generated and manipulated images, for example in the form of morphing, which refers to the seamless transformation of different bodies into one another. In 1987, Peter del Monte shot the psychological thriller *Giulia e Giulia/Julia and Julia* with Kathleen Turner in high definition television format and had the result transferred onto 35 mm celluloid for cinema release. However, the somewhat flat picture impression, which above all did not give the impression of deep sharpness, was criticized, so that the process could not establish itself in commercial cinema at this time.

The fundamental digitalization of cinema only finally began in the 1990s with the digitalization of film editing, after computer-generated images had already become standard. This was followed by digital sound and, since the turn of the millennium, digitalization has also been taking place as a slow, imperceptible process in those areas of film production that were previously believed to be firmly anchored in traditional processes: the recording and projection of cinema films. At this time, an explicit V-Cinema (video cinema) had already been established for years, especially in Japan, and the differentiated digitalization helped it to increase in quality and popularity. In the Western media market, this applied at best to cheaply produced porn films on the home media market.

In this way, feature films were also produced inexpensively in DV format, which proved to be very popular due to the simple handling and technical weaknesses of the chosen format, even if the recording format challenged screen viewing conventions. Anyway, films such as *Festen/The Feast* (1998) by Tomas Vinterberg or *Der Felsen* (2002) by Dominik Graf with their fast, raw, naturalistic images showed early on that digital film could be a serious alternative to classic 35 mm productions, primarily because it remained very close to the everyday viewing

experience of large sections of the audience. However, it was not always a matter of high definition, i. e., the resolution of the film images was consciously sacrificed. Documentary film also changed as a result of digitalization, as the dynamic equipment, the photo-sensitivity of the recording technology and the closeness of the images to everyday life were able to assert their own quality.

The introduction of high-definition video formats in recent years—also on the semi-professional market—is seen as a further significant step towards a fully digitalized production process. At the same time, we can also speak of a digital shift in the audience's viewing habits. The increased use of digital media such as computer games and the internet has not only created new marketing opportunities for film marketing but has also familiarized audiences with the reduced image and sound quality of audiovisual offerings on the internet. On user-oriented platforms such as YouTube or Myspace TV, television programs, video clips, excerpts from films, trailers and, of course, countless private recordings can be accessed in all languages—albeit usually in minimal resolution and with tinny sound. However, this reduced quality not only appears acceptable, but also guarantees remnants of the real, as numerous offerings can be understood as a primitive form of film documentation, the quality of which is hardly discussed as evidence of pre-film reality. The internet in particular seems to harbor those remnants of the real, in those digital images that Jean Baudrillard believed to be completely devoid of it. And so, it is no longer the aesthetic artifice of desaturating color or the wildly moving camera that has become the signature of the real within a production, but rather this reduced image quality, the coarse graininess of overexposed digital video images permeated by staircase formation, which is used by filmmakers in order to achieve an image of the real. However, since 2009, internet providers have been endeavoring to equip the worldwide web with high-resolution images (Stiglegger 2009).

2. The Digitalization of Cinema Operations

HD had established itself as the standard for international cinema exploitation at the latest with the widespread production in HD video format since the turn of the millennium. Only the conversion of the cinema exploitation chain proved to be slow and costly.

For production and post-production, on the other hand, the HD format has proven to be extremely advantageous and versatile, although until 2003 only a few available cameras met the requirements of high definition cinema. For example, the Sony HDW-F900, which processes a resolution of 1920 × 1080 pixels and delivers 24 full frames per second, was widely used. With this recording frequency, it is very close to the convention of an analogue film camera, as can be seen in George Lucas' *Star Wars: Episode II—Attack of the Clones* (2002). This technology is known as HD-24p, where p stands for 'progressive' and refers to the continuous recording of high-resolution full frames (as opposed 'i' for 'interlaced' images). The aspect ratio is always 16:9—corresponding to a resolution of around 2 million pixels per frame. The resulting data volumes are enormous (over 160 gigabytes) and even new formats such as Blu-ray cannot provide sufficient storage space. This changed in the late 2010s with the advent of UHD (Ultra high definition) as a new home video standard—one that never was accepted on a large scale. In fact, in 2024 most home users still seem to be fine with the mediocre DVD quality.

While the recording and projection at 24 frames per second still takes account of conventional film perception and would correspond to a roll-film screening, other significant differences are remarkable: the slight unsteadiness of the celluloid picture is missing, the projection is consistently calm. There is no moving grain in colored areas; these areas appear smooth and even. The image does not flicker. All these aspects mean that unprocessed projected HD images are usually described by cinema-goers as sterile and lacking in atmosphere. However, as the next section will show, filmmakers have numerous stylistic means at their disposal to 'bring back' this cinematic impression retrospectively.

Digital film distribution will be of unlimited benefit to film marketing as soon as cinemas have converted accordingly. The costly and risky shipping of vulnerable film reels is then no longer necessary, and the films can be loaded and projected directly from a server. This is known

as the 'digital roll-out,' which was already envisioned and planned by the studios around 2000.

3. Towards a New Cinematic Aesthetic After 2000

High definition film productions since the turn of the millennium have proven in different but highly convincing ways that HD has its own aesthetic, which is at least not inferior to the familiar impression of 35 mm film. Initially, this was particularly evident in films that had been produced and edited in high definition formats, but which were shown to the general public as 35 mm prints. The aesthetic effect of this format change is not as obvious as in films such as *Der Felsen*, which was shot in conventional video resolution.

Distribution on home cinema formats such as DVD and Blu-ray was particularly important for the commercial exploitation of an HD cinema production till 2010, with the latter preserving the high-resolution format and allowing direct transformation of original data onto the image carrier (topped by UHD in the late 2010s). This means that the diversions via 35 mm film prints, and subsequent HD scanning were no longer necessary. The data reached the home cinema seemingly without any celluloid artefacts.

So far, filmmakers have taken extremely individual and different approaches to the HD format, as four examples may illustrate. In the independent field of European auteur film, the Hungarian Benedek Fliegauf presented his pessimistic drug drama *Dealer* (2004) at the Berlinale: Shot on HDCAM, digitally post-processed, the film was then anamorphically transferred to 35 mm film in a 2.35:1 aspect ratio. Fliegauf impressively demonstrated in a radical low-key aesthetic just how far one can go when deprived of artificial lighting and worked specifically with the newly created

'Pixel grain,' which in the 35 mm print spreads its own, very existential atmosphere by allowing the protagonists to act mainly in semi-darkness or backlighting without any noticeable loss of important details (and thus closeness to the action). The DVD versions are taken from the original material and therefore appear somewhat 'cleaner' than the cinema versions due to the lower resolution.

With his Mayan thriller *Apocalypto* (2006), Mel Gibson directed one of the most expensive American film productions, working primarily with the Panavision Genesis HD camera and processing the material as a 2K master. The film was then transferred to 35 mm film in a 1.85:1 aspect ratio for cinema use. As the film mainly takes place in high-contrast daylight scenes, the 2K resolution guarantees a mostly hyper-real and extremely high-contrast impression, which lends this historical monumental film an irritating topicality and modernity. The viewer gets the feeling of being present in a historical setting many centuries ago, as it not only shines with an astonishing plasticity, but also blurs the boundaries between recorded pre-film and film. This is evident especially during the highly energetic and fast action scene when the protagonist is chased through a densely structured jungle setting. Especially the subtle shades of green spread across the screen provide a vivid hyper-presence that was never before seen on the big screen. Even the most skeptical audiences—smashing Michael Mann's earlier attempts at a digital cinema with his thrillers *Collateral* (2004) and *Miami Vice* (2006)—now could be in awe of what was unfolded in high definition glory. Gone was the darkish and low focus range of *Collateral*. *Apocalypto* granted a new level of immersive cinematic experience—be it in close-ups of pierced faces or in epic wide shots of the Mayan ritual area (Figure 1).

Figure 1: Apocalypto—*hyperrealism in historical settings (Source: Icon Entertainment International/Plaion Pictures, DVD screenshot by the author).*

Reality and subsequently inserted CGI (computer-generated image) elements remained fluid during these wide shots. A striking example of such an impression is the triumphant gesture of the sacrificial priest on the Mayan pyramid, while the crowds gathered below look up at him (Figure 1). This shot combines proximity (to the priest in the foreground, slightly out of focus) and monumentality (through the buildings and the crowd of extras), while in the distance a dramatic lighting mood emerges in the sky. It is an achievement of Gibson's high definition cinema to prevent such an image impression from appearing artificial and contrived. On Blu-ray, the direct transfer of the master to the media carrier immediately achieved reference values for the then still young medium in the mid-2000s. However, this novelty effect has been replaced by later high-resolution productions with IMAX-technology, especially the later films by Christopher Nolan. Nolan's *Oppenheimer* (2023) might be the new reference here when it appeared on UHD-disc format.

David Fincher shot his serial killer film *Zodiac* (2007) on HD video format, desaturating the colors and reducing the hyper-real sharpness in post production in order to achieve a rather flat image impression that corresponds to the aesthetics of New Hollywood cinema—the era in which the *Zodiac* killer committed his crimes. The New Hollywood era between 1967 and 1976 is largely recognized as a Hollywood renaissance after the commercial crisis of Classical Hollywood (1930s to 1960), being defined by films like *The Graduate* (1967) by Mike Nichols, *Easy Rider* (1969) by Dennis Hopper, or *Dog Day Afternoon* (1975) by Sidney Lumet. The US cinema of that time was coined by pop culture, counterculture, and politics. Stylistically, it thus was based on a new realism, using mainly naturalistic impressions of original locations, available light and psychologically nuanced 'underplay' in (method) acting. Films of the era were praised for their gritty realism: William Friedkin used intentionally grainy film material for his urban cop thriller *The French Connection* (1971) to provide this idea of realism. And the paranoia films by Alan J. Pacula risked the image to 'black out' during night scenes to avoid artificial 'cinematic' images in the thriller *Klute* (1971). Things partially remained 'in the dark.' Exactly these were the films David Fincher obviously had in mind when he recreated the era for his film *Zodiac*.

For many viewers, the HD digital origin of the film was not immediately transparent, especially as it achieved the desired quality all

the more in the process of being copied onto 35 mm material. Fincher was not the only filmmaker to point out that although the use of the HD format has the advantage of saving material, it does not make the filming process itself cheaper. The main costs are on the side of casting, promotion and location. The use of celluloid material is not the significant factor in the whole process. This might be different for independent productions as the value of celluloid is still very high compared to the virtually or possible unlimited storage space in digital filmmaking. But for Fincher the idea was the chance to completely control the style of the film via digital postproduction—to be able to replicate a film that feels and looks like the original New Hollywood films of the era. When *Zodiac* came out, it was immediately praised for this achievement, especially as it was a departure from the highly CGI-based predecessors like *Panic Room* (2002), a film that has video game-like sequences when the camera moves smoothly through the ceilings of the house. *Zodiac* manages to simulate the 'gritty realism' of the films by Friedkin and Pacula.

James Cameron, on the other hand, made *Avatar* (2009), an ecology-themed science fiction film that primarily used the HD format to enable an imperceptible fusion of real film footage and calculated CGI images—and to explore the limits of what was then technically feasible in 3D technology. The result is aesthetically like the visual worlds of computer games, because even when actors serve as the basis, the extreme CGI manipulations remain dominant (Stiglegger 2006, 6). The protagonists look like hybrids between humans and avatars—but that is ultimately the program of the film concept: The film had been designed for a video game-addicted audience, one that is used to the artificial looks of the avatars. Even the film's title refers to the phenomenon known as avatar, the individually designed 'stand-in' for the protagonist. Aiming directly at the conventions of CGI-created video games, this film does not even bother to deal with 'grain.' It is completely based on the idea of making the artificial seem the new reality. No image of *Avatar* has the impression of being 'film' in a classical aesthetical sense. All textures seem smooth yet detailed—but always controlled by the world building of the creator. Cameron's idea of cinema to create a simulated world from the scratch. Thus, *Avatar* might be his vision of a future cinema—in contrast to Fincher who carefully recreated the past with means of contemporary technology.

So one can sum up three strategies of contemporary film making between 2000 and 2010: firstly, the embrace of digital high definition technology to create a *new hyperrealism* on the screen (*Apocalypto*); secondly, the attempt to completely control digitally recorded image during the post production process *recreating the celluloid film appearance* (*Zodiac*); and, thirdly, the idea to push the boundaries of a digital world building for the screen resulting in *highly artificial images* (*Avatar*).

But how did low budget independent filmmaking react to the new digital technology of the day? Let's look at the films of a European maverick filmmaker at the time: Nicholas Winding Refn. Originally known for his 'gritty realism' of the *Pusher*-gangster-films in Denmark, Refn moved towards the global screen with more stylized films like *Bronson* (2008) and *Valhalla Rising* (2009). During his workshop at the Film Festival Cologne in 2019, Refn pointed out that he is only able to produce films on a level that don't cost too much so they will return their costs in a mix of cinema and home media distribution. Till today his feature films are bound to comparatively low budgets.

Valhalla Rising is a minimalist and experimental Viking drama that cost no more than 5.7 million dollars (it was considered a flop anyway). Mads Mikkelsen is seen here as a gladiator slave fighting for his life in the Scottish hills of the Dark Ages, eventually freeing himself by force, and escaping with crusaders towards the New World. This could be filmed as a huge Hollywood-style epic with many extras, studio locations, CGI-effects, and stars (Robert Eggers provided that version with *The Northman* in 2021). What *Valhalla Rising* does is the opposite: Refn completely relies on his one star, Mads Mikkelsen, and his respective physical performance. He sets up the gruesome gladiator fights in a deserted landscape devoid of any civilization. Even dialogues are rare and laconic. As One-Eye—the silent protagonist modeled along the Norse god Odin—enters the ship, we never see the open sea. All is drowned in a mythical fog. As late as in the third act, the film opens up to the bright sky of the New World (eventually Canada). Refn never uses CGI to create this mythical landscape—instead he completely stands proud with the digital source material. *Valhalla Rising* never looks like a celluloid epic. It never aims to look like one. On the contrary, Refn films his landscape in a very technical and digital way and obviously manipulates the color schemes, lightning. and textures of the images to invoke an otherworldly atmosphere. What takes place in the Middle Ages in

the end result looks like an apocalyptic science fiction film, a bit like *Conan the Barbarian* (1982) filmed the way Andrej Tarkowski directed *Stalker* (1979). The film never 'feels' historical but weird, mystical and strange in result. This description corresponds to the director's own remark that he was never interested in Vikings in the first place, but in science fiction from the start. The guitar-driven post-rock soundtrack by Peter Peter adds to this unique idea of a completely digital aesthetic vision. Thus, *Valhalla Rising* might be considered a fourth idea of high definition cinema of the 2000s: the open experiment with established film form to expose its own artificial (digital) means to *create a new vision of cinema* which is at the same time strange as it is true to its chosen means.

Seen from today's point of view—as Elsaesser refers to in the initial remark—all examples are equally interesting as proof of how film as an art form immediately reacts to technical changes and challenges. All four examples use their means along their artistic visions, resulting in completely different aesthetics, either hiding the digital (Fincher) or openly exposing it (Cameron and Refn). In each case it shows how filmmakers have consciously dealt with their present chances and came to different conclusions. All four filmmakers have since developed their approaches further with the digital production and distribution changing towards home streaming formats after 2010. While Cameron stayed true to his Avatar-concept in the even more artificial *Avatar—The Way of Water* (2023), Fincher used his Netflix-connection to again create a low-key-digital-thriller with *The Killer* (2023). Refn pushed the limits of digital filmmaking consciously in his promotional clips for Prada as well as the streaming series *Too Old to Die Young* (2020) and *Copenhagen Cowboy* (2022), now focusing on hyper-real high-focus images. Only Mel Gibson has yet to deliver his long announced sequel to *The Passion of the Christ* (2004), *Resurrection*, which eventually might cover Jesus descending into hell and back in elaborate CGI compositions. But this chapter on the second stage of high definition cinema has yet to be written.

4. Conclusion: The Digital Cinema of the 2000s

After a fairly long development period of over 40 years, the high-definition format has started to replace traditional celluloid cinema in the 2010s. More and more cinemas created the conditions for direct projection of HD data, so that the diversions via the 35 mm print had been less and less necessary. Surprisingly, it was not only the large multiplex cinemas that converted to show blockbusters by George Lucas and James Cameron, but also the city-funded art house and communal cinemas in particular, which were confronted quite early on with the situation that the producers of small independent feature films and documentaries could no longer afford to copy them onto celluloid. As a result, HD projection became increasingly important for festival screenings.

Since a young generation is now familiar with classics such as Alfred Hitchcock's *Psycho* (1960) or Arthur Penn's *Bonnie & Clyde* (1967) in immaculate and astonishingly ageless Blu-ray versions, the rainy and faded archive copy from the distributor's basement had become less and less interesting for large parts of the audience. And the diverse ways in which the aesthetics of the high-resolution image are already being used today suggest that it is not really difficult to say goodbye to the outdated carrier material in the eyes of a big audience. The materiality of the medium of film (as a classic roll film) seemed to be buried forever—until concerns about the outdating and decay of digital storage media appeared in the last decade.

In 2024 some prestige films are still shot on pristine celluloid like those by Christopher Nolan and Quentin Tarantino. Most cinemas anyway are focused on digital formats. What remains, as ever, is the seductive play of light on the screen, phantom-like and fleeting. Like technical changes before, none of these were able to alter the basis of elementary film aesthetics—be they based on grain or on pixel.

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Diversity in *Pixar* Films. How Does CGI Influence the Diversity of Character Representation?

Lioba Schlösser

Abstract

This chapter approaches the question of whether the digital turn in the film industry created new ways of character representations in *Pixar* films. How do CGI and digital production influence the characteristics and behavior of the characters? The chapter evaluates how they affect the story or plot line, and whether the character's abilities, skills, and attributes change accordingly. It also analyzes whether these new-looking, CGI-created characters may even reflect social diversity and the value system transported by characters and plotlines. Therefore, the paper looks at the dimensions of diversity as personal aspects and social categories by analyzing *Pixar's Toy Story* (1995), *Inside Out* (2015), and *Elemental* (2023). Approaching these questions can help in understanding animated films' structure and function. Ultimately, the article aims to evaluate the development of diversity in *Pixar* films as well as the representations in current productions.

Keywords

Diversity, pluralism, the Big 8, digital turn, *Pixar*, animated film, representation, stereotypes, film studies, film analyses

1. Introduction: The Digital Turn and Moving Image

The digital turn in the film industry created various new ways of cinematic representations, especially within animated films and *Pixar* productions. Forms, shapes, colors, and much more can now be created without any reference in the non-cinematic world. Among environments and places, characters and figures are influenced by these new possibilities of CGI animation. Before CGI animation, characters in *Pixar* films used to be humans or animals, like in *A Bugs's Life* (1999), or monsters and fantasy figures, like in *Monsters Inc*. (2001). However, all these characters showed a visible reference to humans or at least an anthropomorphic appearance, especially recognizable in the *Toy Story* saga, including *Toy Story* (1995), *Toy Story 2* (1999), *Toy Story 3* (2012), and *Toy Story 4* (2019). Over time, *Pixar's* characters became more and more varied. Nowadays they come in all shapes and forms, as almost everything is conceivable: emotions, elements, thoughts, ghosts, undead creatures, and so on.

Against this background, the question arises whether the increased visual diversity also impacts the actual content of the films. Does the representation also influence the conveyed value system, which is transported via the characteristics and behavior of the characters? To what extent have the new shapes and forms changed the character's abilities, skills, and attributes? Do these new-looking, CGI-created characters maybe even reflect social diversity?

To approach these questions, this paper looks at the dimensions of diversity as personal aspects and social categories. It focuses on the "Big 8," which are defined as the most important aspects of American society in which the *Pixar* universe is created. Do *Pixar* films represent these categories within their characters? Did these aspects become more accessible over time? Can characters nowadays provide perspectives of diversity, sociocultural differences, and a variety of features?

To analyze this, the chapter looks at the films *Toy Story, Inside Out* (2015), and *Elemental* (2023). These films will be analyzed in particular regarding the characters, their constellations, actions, skills, and attributes. Although classical film analysis cannot be applied to animated films in all areas (e. g., camera and lighting), character analysis is perfectly suited for *Pixar* productions. Therefore, *Elemental* seems especially interesting because it presents queer, non-heteronormative characters.

The chapter is divided into six chapters. This introduction is followed by an overview of the concept and the four layers of diversity, explaining the structure, fiction, and use of this concept in Western society. After, a section on stereotypes in society and film evaluates biases and preconceptions in people's minds and resulting stereotypical film characters. Based on these theoretical approaches the characters of the three films are then analyzed as explained above. The analysis is mainly based on film theory (Richard Dyer 2000, Joseph Campbell 2008 [1949], Jörg Schweinitz 2011), a theory about diversity and diversity management (Huesmann 2021, Lutz et al. 2016), as well as cultural-critical essays and articles on *Pixar* films and their characters. The following conclusion summarizes the most important results and presents the elaborated answers to the initial questions.

Ultimately, the chapter aims to provide an overview of existing approaches to diverse representations in *Pixar* films. This seems important because Western society is becoming increasingly aware of its diversity, and it seems only logical to reflect this development in films, especially those aimed at a younger audience. Therefore, the answers to these questions could help to understand the development of representation over the past 30 years. In addition, they could give an insight into *Pixar's* general character construction and constellations. However, CGI development as such is forward-looking and therefore offers a reasonable starting point for cinematic diversity research within the field of animated films.

2. Diversity and Stereotypes as Social Categories

The term diversity refers to explicit differences among group members in social categories, which have a range of different social and ethnic backgrounds, genders, sexual orientations, and so on. In theory, these diversity aspects are divided into four layers: the organizational dimension, the external dimension, the internal dimension, and, visualized as an inner circle, the personality of the individual (Figure 1). The outer dimension includes organizational aspects like work location, seniority, management status, and organizational function. The middle dimension describes the social identity and the environment of a person. It

includes religion, income, parental status, geographic location, and educational background. The inner dimension includes age, gender, race, sexual orientation, physical ability, and ethnicity. The more internal the features are located the less control a person has over them. For example, individuals can choose and change their work location and unit, but not their race or sexual orientation. While features such as age, gender, or color of the skin are often visible, some features like socio-economic background, cultural origin, religion/philosophy, family situation, or chronic disease remain invisible and therefore harder to grasp.

Understanding the diversity features of individuals and their roles in society implies a closer look at the differences and similarities of structural discrimination. This requires a multidimensional understanding of diversity: individual features of diversity are not intrinsically homogeneous, nor do they appear individually only. In addition, there may be interactions, dependencies, and relations between them. Depending on the life phase and personal situation, different characteristics be-

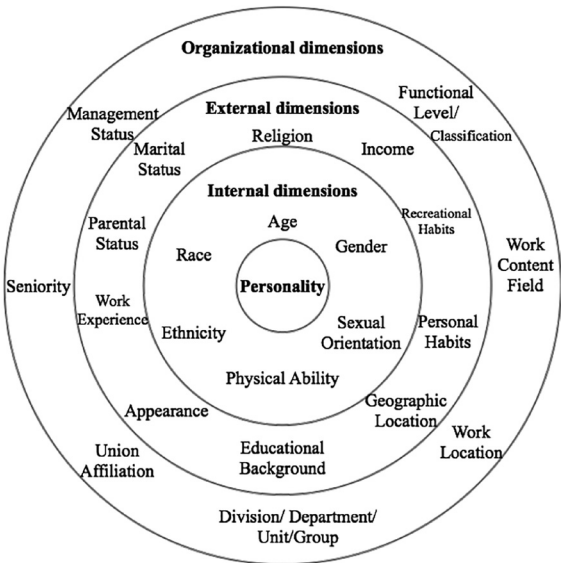

Figure 1: Adapted from Layers of Diversity. (Source: Gardenswartz, Lee and Anita Rowe. 2003. Diverse Teams at Work: Capitalizing on the Power of Diversity. *Society for Human Resource Management, Alexandria, 33).*

come more or less important for different individuals. Often, a fluid and changing combination of characteristics contributes to a person's character and behavior. The term "intersectionality" summarizes this interdependence of diversity features; any individual has many features that often interfere with each other in ways that make social life a lot more complicated. (Lutz et al. 2016, 8ff) For example, the issues that come with being a non-binary, minor parent, or a working class single mother. In addition, the negation and condemnation of homosexuality in some religions can make life unbearable, as well as being a disabled person of color in a white Western work or education environment. The mutual influence of characteristics, which are categorized in the internal dimension (such as age, gender, class, or ethnicity) is evident in every person and determines their success or failure in life. However, discrimination needs to be understood as a systematic conglomerate of power structures. A dominant majority (e. g., white, male, heterosexual, middle-aged people) exerts power over a minority (e. g., young, homosexual, female people of color) to oust them from potentially powerful positions within society or to prevent them from rising to these positions in the first place. There are many reasons for such behavior. In most cases, it is based on a form of maintaining power, based on the fear of losing privilege.

The aspects of diversity that make an individual a minority or majority vary from culture to culture. In the US, on one hand, the origin of *Pixar* productions, the so-called "Big 8" have been identified as significant for the status quo in American society. The "Big 8" are race, gender, ethnicity/nationality, organizational role/function, age, sexual orientation, mental/physical ability, and religion. These aspects are especially important when it comes to success in other categories income, quality of workplace, institutional role, and so on. In Germany, on the other hand, the focus is often placed on the characteristics of gender (e. g., women or non-binary people), culture (e. g., nationality or migration), age, and parental status (e. g., work-family balance, often in connection with gender or sexual orientation) (Huesmann 2021, 251).

The importance of these aspects is culture-bound and makes it easier for people to categorize others into groups so that they can check their affiliation, and assign themselves. However, this grouping also leads to stereotyping. Stereotypes can help people find their orientation in complex environments because they simplify perception. Stereotyp-

ical attributions also serve the purpose of reducing complexity and categorizing the world around a person. In most cases, they are used to fit a new situation or person into a familiar pattern. Complex situations or things become easier to handle and understand. Such stereotypes are sometimes adopted as socially shared beliefs. They are perceptions of certain social groups about others and therefore collectively known and understandable. Cultural stereotypes in particular act as a grid in the mind so that only the appropriate behaviors or characteristics are perceived and then function as a confirmation of the images in people's heads. In general, all people have ideas about what they expect from others, and how they judge others even before they get to know them in person. These images are also depicted, supported, or even created by the media, especially by moving images and films. Films present artificially generated images of a possible or impossible reality that is connoted with up- and downgradings and that also transfer to characters.

3. The Role of Stereotypes in Films, and Types in *Pixar* Productions

Films contain stereotypes on very different levels. Stereotypical for most fictional films are, for example, "the construction of the characters and plot, image and sound, as well as the acting. Stereotype theory even plays a central role in the conceptualization of film genre," states film scholar Jörg Schweinitz (2011, 42). He refers to the fact that stereotypes, nevertheless, mostly describe conceptions concerning social or ethnic groups and their members, usually as "images of the other" or, less often, as "images of the self." Therefore, stereotypes comprise a stable and repetitive set of characteristics associated with "the other" or "the self," mainly to make the film character comprehensible without major effort (Schweinitz 2011, 42). A particular film character is provided with a predetermined set of characteristics to integrate them perfectly into the plot, of course, with as little contradiction as possible. They always carry a whole narrative within themselves that explains their features and characteristics. Most of these figures do not develop or grow, which makes them a "type" (Dyer 2000, 13), a flat character,

defined by one or just a few, stereotypical character traits. Types fulfill a certain role within the story, are "immediately recognizable" within that role, and can also show up as so-called "archetypes" or "social types," who are "representations of those who 'belong' to society" (Dyer 2000, 14). Archetypes on the other hand, as originally defined by C. G. Jung are more concepts based on features and characteristics than actual characters. They are "containers of images" (Hauke and Alister 2001, 62) and define themselves through their personality, function, and actions, while their role and appearance is not important. The "Explorer" for example can be a fearless adventurer traveling the world as well as a lonely spaceman exploring space or the little boy catching butterflies in his parent's backyard. The "Innocent" can be a little kid as well as a virgin lover or a random civilian, who gets randomly involved in a crime. The "Caregiver" can be a mother, a nurse, or even a dog owner. The most common archetypes that appear in films are: the Sage, the Innocent, the Explorer, the Ruler, the Creator, the Caregiver, the Magician, the Hero, the Outlaw, the Lover, the Jester, and the Everyman.

Dyer states that most types function as a "mode of characterization in fiction" (Dyer 2000, 13). This also implies that the actions and development of this particular film character are always predetermined, similar to what is evaluated in *The Hero's Journey*, described in Joseph Campbell's *The Hero with a Thousand Faces* (2008 [1949]). The hero's journey also creates stereotypical gender-based roles that are rather traditional. The male is constructed as active or dominant and the female as passive and controlled by the outer world. These on-screen representations reflect the structure of the patriarchal society that favors the masculine over the feminine. Male individuals have control and power and female individuals are seen as objects. The "otherness" of women is always mirrored within their representation (Dyer 2000, 15). The repetition and reproduction of these gender roles and social positions serve to reinforce these ideologies, resulting in a narrow range of visible possibilities for women and non-male individuals.

Also, a relation between film genres and stereotypical characters accrues. The genre can be important for the choice of the types presented. A melodrama often presents social types, whereas a fantasy film includes mostly archetypical figures. Also, the main character of a western will always develop differently than the main character of a romance or a comedy, just because the genre structures and stereotypes are created

differently. This also means that the characters within a genre have clear similarities with each other, no matter how different the storyline is. Nevertheless, genre conventions have mellowed and changed over time, so that variations in the repeating character constitutions appear, and create room for alternate characters are representations.

In general, films reflect the nature and structure of the society in which they are produced. Stereotypes as Dyer states are projections of arty of the real world (Dyer 2000, 13), and therefore vary from culture to culture. Considering the layers of diversity are stereotypes also important because they can make the invisible visible. As explained, some diversity features cannot be seen at first glance unless the individual chooses to stress and show them purposely (Dyer 2000, 16). Types can perform these features effortlessly because they stereotypically embody these features. Thus, it is no surprise that some of the previously described types can also be found in *Pixar* productions. Not only stereotypical characters and types can be identified, but also so-called *token* characters. The *token* character is a film character designed to include certain minority groups in the plot, without the actual need to do so for the storyline. This serves several purposes: making the film look more diverse, open-minded, and inclusive. It allows the producers of the film to broaden its appeal by giving more viewers protagonists they can identify with. This is useful for bringing discussions of race, gender, and sexual orientation into the storyline, and the whole agenda surrounding the film. This leads to wider marketing and advertising options, and eventually more views, and more revenue. What influence does such a character have on the film? Do they even bring actual diversity into the storyline or are token characters only important for economic reasons? These questions will be approached in the in-depth analysis of the character Lake from *Elements*. At first, patriarchal structures and stereotypical American icons, represented in the *Toy Story Saga* are examined to show how these stereotypical heroes are portrayed.

4. Patriarchal Stereotypes and American Icons in *Toy Story*

Toy Story was *Pixar's* first full-length feature film. *Pixar* itself was founded in 1979, as part of *Lucasfilm*. They became an independent production company in 1986 after Steve Jobs bought the department. Around that time, *Pixar* only produced short films for entertainment and advertisement. In the 1990s, the first contract between the company and the *Walt Disney Studios* was signed to produce *Pixar's* first film for *Disney*. This film was *Toy Story* (1995), which was a huge success.

In the tradition of 1990s cinema, *Toy Story* tells the adventures of cowboy Woody and Buzz Lightyear. Both of them represent stereotypical American male heroes who fight for their country and its borders. Buzz embodies the wild western cowboy, Buzz the fearless astronaut. Even the introduction of the female cowgirl Jessie in *Toy Story 2* does not change this dynamic because Jessie nevertheless remains a side character. Interestingly enough, Buzz can be seen as the modern version of a traditional cowboy. He is a space cowboy, who is just a better substitute for the old-fashioned western hero. Both fulfill the stereotypical idea of the American frontier myth, either on Earth or in space. Therefore, Woody fulfills several stereotypically male roles by acting as the primary protector and provider to the group. Other toys depend on him, look up to him and he seems to be the hero of the group, at least until Buzz appears. His heroic qualities are represented through his selfless, caring, and self-conscious personality. Tom Hanks, who was known as a very likable, relatable 'everyman' actor during the 1990s, voices him and transfers this image onto the character. Buzz on the other hand, embodies the traditional action hero. He is part of the 'Universe Protection Unit' and therefore brave, stubborn, adventurous, and seems a little arrogant at first. His appearance is stereotypically masculine. In comparison to Woody's soft, slim physique, he is bulky with muscles, broad shoulders, and a white, sturdy uniform with many modern functions, like a laser and foldable wings. He immediately sees Woody as his rival and for a moment they both try to become Andy's favorite toy, the group's leader, and therefore the function as the archetypical hero of the story. His catchphrase 'to infinity and beyond' suggests that there is no limit for him or his imagination. His world has

no borders just like the world of a modern American space cowboy. He is voiced by Tim Allen, who was known as the entertaining guy next door, who is charming, funny, and doesn't take life too seriously. This image gives Buzz lightness and daring in the face of danger.

In fact, both main characters are different versions of the archetype of the hero. To be more precise, the typical American male hero. They both embody the brave frontier fighter, who is rooted in American history and the American founding myth. Both of them fulfill these roles precisely and do not show a lot of diversity within this representation. Moreover, Cowboys and astronauts seem to be icons of little boys' dreams, and therefore very special toys, at least in a traditional childhood story. Nevertheless, the film was produced in the 1990s, a time in which ideals and icons were a lot more tradition-based than they are nowadays. With the latest volumes of the *Toy Story*-franchise comes more variety in representations. *Toy Story 3* has Barbie and Ken as archetypes of lovers, who both embody the traditional representation of these pop cultural, gender based icons. Both are defined by their looks, fashion, and material belongings, Ken especially. He is even described as a "girl's toy," in a very contemptuous manner. This shows how gender is still a strictly binary and hierarchic category of order, in which the male seems to be more appreciated than the female. Even though Barbie becomes an important and active figure in saving Woody, she still sticks to the image of the little girl's toy with a certain appearance that nevertheless remains a side character. Both Barbie and Ken therefore remain archetypes, and flat figures within their stereotypical, well-known traditional role.

These evaluations are to show that the *Toy Story franchise* does not provide a lot of diversity, not even within the newest editions to the series—although all characters are toys and therefore created throughout kids' fantasies. This should give them endless options within their representations, which are unfortunately not fully utilized to make them compatible for a hung audience that might have conservative opinions.

5. Token Characters and Types in *Elemental*

If one considers *Pixar* films in terms of their diversity, *Elemental* is particularly important. This film is the first and only *Pixar* film to have a non-binary character. But how much does this influence the storyline or message of the film? At first glance, the non-binary figure Lake could be a token character. Lake is introduced as the younger sibling of protagonist Wade Ripple. In this role, Lake is constructed with zero characteristics, no function for the actual plot, and only a few words of dialogue. Lake says: "Following in Mom's wake." to explain how Lake and Ghibli study architecture (*Elemental*, 00:53:50). Without doubt, Lake is a so-called "flat character," which is constructed around a single idea or quality (Schweinitz 2011, 46)—in this case the fact that Lake is non-binary. Yet, Lake is introduced with the pronoun "she/her" instead of "they/them," which would be normally used for a stereotypical non-binary character. Wade introduces Lake's girlfriend Ghibli as "her girlfriend" (*Elemental*, 00:53:00) to Ember and the audience, and, at the same time, refers to Lake with standard female pronouns. In spite of that, *Pixar* introduced Lake as their first non-binary character while advertising the film. Also, Lake's voice actor, Ava Kai Hauser, is non-binary and uses they/them pronouns. Hauser even posted about Lake as *Pixar's* first non-binary character on X (formerly *Twitter*), writing

> BIG ANNOUNCEMENT [sic!] I got to play Pixar's first nonbinary [sic!] character! Meet Lake! I voice Lake in the new movie #Elemental! I'm seeing it in theaters tonight with my friends, so you can catch it in theaters too if you wanna [sic!] see them. (Hauser on X, June 16, 2023).

This shows that Lake was mainly used to advertise *Elemental* as a queer-friendly and inclusive production, whereas the actual plot does not mirror this, because the main couple is not queer at all. With only one sentence of dialogue and an appearance time of less than a minute in total, Lake is indeed a flat character with a token function. A round character would have been constructed with many different, often opposite, or contradictory character traits. To describe this difference, Richard Dyer mentions an opposition between "novelistic character" and "type," as described earlier (Dyer 2000, 13). Lake is a non-binary type, whose only function is to be a gender non-con-

forming person, to attract a like-minded, queer-supportive, so-called "ally" audience.[1]

Further analysis shows that the other characters of the film are more or less stereotypical flat characters as well. The film uses figures that are less complex and easy to read. Schweinitz calls these figures "individualities" (Schweinitz 2011, 47) because their individuality is constructed to fit the plot, and not make them actual round characters. In *Elemental* these "individualities" are created to develop a coming-of-age love story between two opposite elements, the fire-girl Ember and water-boy Wade. Both are defined by binary and normative gender representation as well as normative identity and heteronormative orientation. Their diversity comes into play as the specific racism between the fire and water community is thematized. On one hand, Wade's family welcomes Ember with open arms and tries to make their water-filled house safe for her as a fire element. Ember's father, on the other hand, seems to hate Wade as a water element so much that Ember has to keep their relationship a secret. Ember's family has a migration background that plays into her father's attitude. The family came as immigrant workers to Elemental City and opened the business that Ember was supposed to run one day. Therefore, they are seen as strangers, outsiders, and maybe even as dangerous intruders by the other elements because fire can be dangerous to them. Accordingly, the love story evolves around these two characteristics: The teenage couple cannot be openly in love because of the stigmata of their race or social background, in this case, their elemental identity as fire and water elements. The character's diversity features are confined to the aspect of race, gender, and sexual orientation. Discrimination is addressed in the form of racism, which prevails subliminally between fire and water, whereas intersectionality is not addressed at all. Their character only evolves around features that are important for the main plot, a very normative coming-of-age love story.

1 Ally is a term that is used to describe a non-queer, mostly heterosexual group of people, who openly support the LGBTQIA+* community without actively being part of it themselves.

6. *Inside Out* as an Emotion-Based Coming-of-Age Drama

Inside Out also includes stereotypes and individualities. The protagonists of the film are basic emotions in the mind of an eleven-year-old girl named Riley: Joy, Sadness, Fear, Disgust, and Anger. As Riley's basic emotions, they are responsible for her feelings, which are linked to her memories, and lead to her decisions. Joy and Disgust appear as stereotypical females, and Fear and Anger as males. Sadness seems based on her appearance neither of the two, but uses the pronouns she/her, and is therefore defined as female. After all, their genders, backgrounds, ages, and other features are not important to the plot, because emotions do not have these features. Instead, these protagonists are defined by the characteristics of the emotions they embody. Sadness is a very blue character, who mostly seems depressed and negative. She only sees the bad, and never laughs or even smiles. Her colors are blue and white. Joy is a very happy and positive figure, and tries to see the good in everything. She's wearing a summer dress, and her colors are different tones of yellow, green, and blue. Fear, of course, is mostly fearful, extremely careful, and seems to be panicking over almost everything that happens. His colors are different purple tones, and blue, in a checkered black-and-white sweater. Anger is very easy to provoke, he gets angry over little things, and freaks out quickly. He is mainly red and brown, wearing a white shirt. His hair is on fire, especially when he gets upset. Disgust is completely covered in green tones, with a purple scarf around her neck. She is disgusted by almost everything, as is shown on her face which features big eyes with long lashes.

This shows how the characteristics are mirrored in the appearance of the figures. Red is indeed associated with anger, green with disgust, blue with sadness, purple with fear, and yellow with joy or happiness (Marschall 2005). Their appearance embodies who they are, which also means that they are pure types that cannot grow or develop new characteristics. Nevertheless, they can learn, make new experiences, and gain new knowledge, as Joy and Sadness do while they try to get back to the headquarters. Interestingly enough, Joy seems to be supposed to act as the archetypical hero, who saves Sadness and Riley, by solving the issue. However, as the story develops, she cannot fulfill this task fully, because

she has to stay within her emotion-based characteristics. Although she is brave and smart, she never gets discouraged or sad, which seem to be necessary feelings for the archetypical hero. Nevertheless, she can be seen as a different version of this archetype, or at least, as a flat character representing the hero. This shows that all figures in *Inside Out* are pure stereotypes that cannot be seen as social types or actual archetypes. Although emotions can be considered as social features, these characters do not represent actual people, who would always show more than one basic emotion. Only all of them together can generate a well-rounded personality, which, would be the identity of Riley. Nevertheless, Riley is not a rounded character either. Her actions are guided by her emotions, thoughts, and memories. Her motivation to run away from her new home is homesickness, expressed by feelings of sadness, fear, and anger. Her actual personality traits are not shown or thematized mainly because they do not contribute to the plot. Everything in *Inside Out* is about her feelings and emotions. Her actual needs, wants and features do not matter, nor does she develop or grow as a representation of a female teenager.

This shows that the plot of *Inside Out* can only unfold because the characters are fully constructed without any contradictions. Only together do their features as basic emotions form a human personality. This realization is the central message of the film. A healthy life can only be led if all emotions work together. Every emotion, even those that initially seem negative, such as fear, disgust, and anger, is important. They are all part of human existence and life and shape people's characters and decisions, from childhood onwards. The structure of the film and the construction of the character are essential to convey this message. Only together, the representation of the stereotypical characters leads to a successful story.

7. Conclusion: Stereotypes as a Guarantee for Popular Success

Stereotypes have a long and storied, savory history in film, and stress certain features or circumstances that would otherwise remain invisible. They can help, to make characters and their actions easier to understand and well readable for the audience. Stereotypes can be categorized as classical archetypes, social types, or other types, that are constructed to stress mostly one aspect or feature of the character that is especially important for the plot or the general message of the film. Some characters are even reduced to one single attribute that has no importance for the plot. Their function is to appeal to a particular target group or to fulfill the basis of a marketing strategy. These types are called token characters.

In general, all stereotypes are defined by role, appearance, and representation of the character, and mainly show a consistent image of a person with a compelling personality profile. Archetypes only provide guidelines for characterization, almost like a brief concept that needs to be provided with content. They function like a vessel, in which all sorts of features and characteristics can be filled.

The analysis shows that these different types can also be found in *Pixar* productions. *Toy Story* works with archetypes of classical male heroes, which are representations of the American founder myth. Both main characters are provided with attributes of the classical film hero. Woody, however, seems to be more of a community-oriented, social western hero, while Buzz is the classical fearless and borderless action hero. Both are male, white, and hetero and represent old-fashioned conventions like strength, fearlessness, and masculinity. Also, they're both icons of the American founder myth: Woody is the classical western hero und Buzz represents the modern version as a space cowboy. *Elemental* presents a different type of character. Lake Ripple is a non-binary, non-heterosexual character, whose only feature is to represent the LGBTQIA+* community. Lake does not contribute anything to the actual plot and has no other function or use, which makes him a classical token. This seems to be a try to incorporate more diversity as the analysis of *Elemental* showed. This attempt seems more focused on marketing and sales than on increasing the actual diversity of the

characters. Lake, who was advertised as *Pixar's* first non-binary character turns out to be a simple flat token character who adds nothing to the plot. The emotions in *Inside Out* are non-human types as well. In contrast to the previous examples, it has been shown that this specific constellation of types is important for the plot of the film. The types embody the characteristics that define who they are, which also means that they are only capable of acting if they work together.

Interestingly enough, the analyses showed that also all human characters in the mentioned films are white, binary male/female, young, and belong to standard American middle class families. None of them represents a round character, even though the considered films are made for a younger audience, who might identify with them.

During the last ten years *Pixar* came up with non-white characters like *Coco* (2017), and *Soul* (2020). This shows that there is a slight change visible over time. However, this form of diversity does not mirror society or reality. It presents stereotypical character traits for specific types of individuals, which are suitable for a certain storyline. As the analysis shows, most characters provide a fixed set of features that are not controversial but contribute to their role within the plot. This leads to characters that are easy to read and understand, but not very diverse. In times of increasing awareness for diversity and the issues of minorities in Western society, this representation might not be the best solution to create a modern, but nevertheless a well readable, mass compatible and therefore successful film.

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Video Game Technologies in Post-Cinematic Imagery

Cyrill Miksch

Abstract

This paper analyzes how technological procedures and aesthetic practices that originated in video game production inform contemporary post-cinematic filmmaking. Drawing on case studies that highlight the patching of film versions (*Cats*), the employment of game engines (*The Mandalorian* and *1899*), and the possibilities and pitfalls of virtual character creation (which fueled the Hollywood actors' strike of 2023), it argues that there has been a fundamental shift in cinematic imagery since the digitalization of film and cinema.

Keywords

Post-cinematic film, video games, digitalization, virtual production, game engines, artificial intelligence, film aesthetics

1. Introduction

The digitalization of film and cinema has not only changed the medium's material base, but also its modes of production, distribution, and reception. While, historically, technological transformations have often led to aesthetic and practical changes, the changes wrought by digitalization seem more profound. By becoming data packages, movies lose their material specificity, and, as films begin to share the possibilities of modulation and editing found in other media, the borders between them become fluid.

In this new constellation, the video game occupies an especially prominent position, since it has always been a digital medium. The following will show how aesthetic practices and technological procedures that originated in video game production are influencing contemporary post-cinematic filmmaking. After a short overview of the recent processes of digitalization, the main strands of academic discourse regarding the transformation of cinema, and the conceptual distinctions of digital film technologies, three case studies will be discussed: the patching of films and its use in the musical *Cats* (2023); the use of game engines in virtual film production (*The Mandalorian* and *1899*); and the role of digital characters and artificial intelligence in the Hollywood actors' strike of 2023.

2. Digitalization

2.1 Post-Cinematic Film Discourse

Digitalization has led to the radical transformation of film production, distribution, and reception. Celluloid film and its analog successors have been replaced by data. When watching a movie in the cinema, we almost never see film, but a digital cinema package (DCP): data that is read out by a computer and projected onto the screen. Furthermore, cinema as the location for a film's reception has lost its significance. More and more frequently, movies are watched at home on a television screen or on the go via laptop, phone, or tablet. And, with the rise of file-sharing and streaming companies, the distribution of film has also changed.

Whereas movies were first shot analogously and then digitally processed in a second step, nowadays they are almost always shot digitally from the start. What once was post-production has become more and more part of the shooting itself. Computer rendering techniques, filters, and CGI inserts can be implemented in a projection of what the finished movie will look like while the movie is still being shot. This has changed production processes directly, but they have also changed indirectly due to the changes in distribution channels and reception habits. For example, Netflix uses information mined from audience behavior to guide its own productions (Adalian 2018): film production as feedback loop.

The change from analog to digital filmmaking—especially since cinema's adoption of digital projection in the early 2010s (Bordwell 2012, 9f.)—has been accompanied by an academic discourse questioning whether digital film and cinema still remain film and cinema, as well as whether one can establish continuity between analog and digital forms. The paradoxical wording of "post-cinematic film" or, for example, "film after film" demonstrates the puzzle of getting hold of this new phenomenon (Hoberman 2012; Hagener, Hediger, and Strohmeier 2016).

Two main positions can be discerned. One sees a "relative stability of the aesthetic practice" of filmmaking in a medium that always has been the subject of technological change (Rothöhler 2013, 11, translation: CM). The other sees a rupture that limits film studies to film history (Schlüpmann 2020). This chapter takes a third position as a working hypothesis: There has been a fundamental transformation, but instead of limiting film studies to history, digital film should be considered as a new medium that has to be studied not in relation to film history but in the context of the digital media constellation in which it is embedded.

2.2 The Video Game as Genuinely Digital Medium

As Horkheimer and Adorno note in their chapter on the culture industry, "Culture today is infecting everything with sameness. Film, radio, and magazines form a system. Each branch of culture is unanimous within itself and all are unanimous together" (Horkheimer and Adorno 2002, 94). The "sameness" of which they write is an economically pro-

duced one. However, today, sameness has become technologically and materially implemented. As a data package, post-cinematic film cannot be distinguished on a material basis from other contemporary media: music, images, and text now all exist as data, although they need to become analog again (as light and sound waves) in order to be perceived in their intended ways (Pias 2003).

Whereas music, images, and text had to be digitalized to exist in their contemporary form, the video game is a genuinely digital phenomenon: Video games have always consisted of data that has to be processed by computer. There are good reasons to think of video games as part of the long cultural history of game playing. However, without wanting to deny the similarities between analog and digital forms of games all together, video games only rarely implement a game mechanic that was playable in pre-digital times, in chess programs for example, whereas mp3 files or e-books simulate or emulate analog music recordings or books. Moreover, when games implement pre-digital mechanics, they seldom do it as a replacement for a game to be played by two persons sitting together. Most of the time video games produce aesthetic experiences that are of a kind of their own and that are bound to the entanglement of player and machine in input-output loops, something that is a genuine feature of computer systems (Galloway 2006, 1f.; Pias 2002, 6).

Therefore, it seems promising to turn to video game technologies and practices to seek the techno-aesthetic influences on post-cinematic imagery. Connecting technologies and aesthetic practices in this way is guided by Adorno's concept of "Technik," with which the author highlights the entanglement between technologies and aesthetic practices (both referred to with the German word *Technik*) (Adorno 1997, 33ff). In contrast to the fundamental opposition against media culture in the *Dialectic of Enlightenment* (Horkheimer and Adorno 2002), Adorno develops a more nuanced position in his posthumously published *Aesthetic Theory*. Here, he criticizes Walter Benjamin's emphasis on mechanical reproduction by pointing out that technology and reproducibility have always been part of aesthetic production. Aesthetic practices are based in technologies that have been developed outside of the aesthetic realm. Thus, on the one hand, connected to the dominant social structure, aesthetic practices can act as resistance against oppressive social relations, due to their capacity to imagine the fulfillment

of technological possibilities currently fettered by political conditions (Adorno 1997, 33). Referring to Arthur Rimbaud's postulate of radical modernity, Adorno envisions a truly modern art as one that is on a par with technological progress and current experiences, "an art in which the most progressive and differentiated technical procedures are saturated with the most progressive and differentiated experiences" (Adorno 1997, 34). While this is not the place to discuss the political potential of video games and their specific modernity, and even less the place to discuss the concept of art, it is certainly not farfetched to think of video games as being on a par with current technological potential, considering that information technology is currently driving the most profound transformations in every sphere of society.[1]

2.3 Digital Technologies

In order to grasp the specific contribution of video games to post-cinematic film, video game technologies need first to be distinguished from other digital film techniques.

First, there are practices that merely simulate analog procedures. In this way digital editing has, for example, replaced film cutting. Functionally, as well as in perception, both techniques are identical. The only difference lies in the technological foundation: In digital editing, data blocks are re-written; cutting a film involves literally cutting a piece of film and gluing the pieces back together in a different order.

Second, there are digital techniques that are based in already established procedures of analog production but that extend their possibilities. Green-screen technology can, for example, be understood as an extension of matte paintings or rear projection. All these techniques insert material from a different source into a film scene. However, static paintings on glass or projected film scenes cannot be adjusted to actors' play as freely as computer-generated imagery.

1 A more direct connection to contemporary technological developments can be seen in machine learning. The specific processing power needed for deep learning calculations is provided by graphics cards that were originally developed for video games (Garisto 2024).

Figure 1: Holy Motors *(F/D 2012).*

Third, there are genuinely digital techniques that intervene in the data structure of video files, something that is just not possible with analog material. Datamoshing, for example, is a technique that intentionally manipulates the video codec in a way that pixel color information is not updated properly from frame to frame (Holl 2009). Thus, old picture fragments cling on, leading to a smudged image. An example of this can be found in a scene in Leos Carax's *Holy Motors* (F/D 2012), in which pictures from a graveyard road get smudged in this way (see Figure 1).

The techniques that will be discussed in the following sections are genuinely digital techniques. They are neither merely simulations of analog procedures, nor extensions of established techniques. In contrast to other genuinely digital techniques, however, they originated in video game production: patching, game engines, and non-player characters (NPCs).

3. Patching (*Cats*)

The star-studded, CGI-heavy musical *Cats* (USA 2019) made headlines when it was released to audiences in 2019. Most of them referred to the allegedly uncanny and grotesque looking human–animal hybrids that populated the scenes. But the movie made headlines for other reasons

too: A few days after it was released, the production company informed movie theaters that a new version of the movie, with "improved visual effects," would be available for download (McClintock 2019). The practice of providing updates to an already finished product is widely used in video games, where it is known as *patching*. The production company's announcement even reflected current practices in the video game industry: The director Tom Hooper stated at the New York premiere that work on visual effects had finished just in time for its first screening and that he, and presumably others, had worked for 36 hours non-stop to get the film ready. In recent years, many video game companies have been accused of so-called *crunching*, that is, working frantically overtime to meet the publishers' deadline and rarely managing to create a finished game in the end. Thus, games are released partially unfinished, at times almost unplayable, with several patches delivering improvements in the months afterwards (e. g., *Cyberpunk 2077*).

While it is common practice in video games, to change movies after they have been distributed to cinemas is remarkable. Of course, there are instances where this occurs. For example, a director's cut of a film might come into the cinemas as a changed version, offering a supposedly original vision of the director previously held back by the production company. Special versions of films for different countries have also been released. It was, for example, common practice from early cinema onward to substitute a happy ending to a film for a tragic one for the Russian film market (Bulgakowa 2012, 3). Finally, film restoration might lead to another run of a film in a renewed version. Nonetheless, these instances offer either a complete overhaul of a film, many years later, or they just include or remove specific scenes. The way in which a change of visual effects is implemented, however, is of a different order. It needs an intervention in the inner fabric of the film that could not be achieved with analog film, especially not in such a short time. Furthermore, the logistics necessary for printing new film copies for thousands of cinemas and delivering them is far less manageable than providing links or delivering hard drives of film data.[2] The very possibility of patching movies is based on their being data packages and

2 The fact that the changed film as a whole was distributed and not just a file that executes the changes on the existing data packages in the cinemas, however, is a difference to video game patching.

thus re-writable, and this leads to a specific historicity of digital film, which analog film lacks.[3]

A scene from George Lucas's *Star Wars* (1977) offers an example of this kind of historicity and its change from analog to digital times. It is the scene in which smuggling co-protagonist Han Solo confronts the bounty hunter Greedo. In the original film, Han Solo seems to kill his opponent in cold blood. This was later thought to be a bit harsh, and the scene was altered. In the revamped version of the film from 1997, which incorporated CGI elements, the alien shoots first, making his killing an act of self-defense (in Hollywood space logic). The scene was altered again for the DVD release in 2004. In this version, both characters seem to shoot almost simultaneously. Further changes were made in a subsequent release on Blu-ray (2011). The last change was made for the film's distribution on Disney+, the streaming platform of the Disney Corporation, which has owned Lucasfilm since 2012. Greedo now mumbles something before shooting and getting shot (Abbad-Santos 2019). Now, existing on stream, future changes to the scene will not require new cinema runs or home video releases but can happen directly on the streaming platform's servers.

Alongside James Cameron, George Lucas was one of the driving forces behind digitalizing film. Lucas had long dreamt of streamlining the production and distribution processes for his CGI heavy productions. His success in getting the major US cinema companies to abandon their 35 mm projectors in favor of digital projection devices in the early 2010s in order to be able to show digital 3D films, sealed the transition from analog to digital (Bordwell 2012, 64ff). Lucasfilm and its special effects unit, Industrial Light & Magic (ILM), are also behind the next case study.

3 Of course, analog film possesses historicity as well, for example due to the degrading of colors of its prints.

4. Virtual production

4.1 *The Mandalorian*

Developed by ILM, StageCraft is a virtual production set in which video game technology contributes substantially to post-cinematic filmmaking. It was first employed for the *Star Wars* TV show *The Mandalorian* (2019–) on Disney+, the science fiction show about a mysterious bounty hunter turned foster dad. The main element of the production set is a curved wall of LED blocks, called the Volume (see Figure 2). It is 21 feet tall and 75 feet in diameter and covers 270 degrees of the set (Industrial Light & Magic 2020; StudioBinder 2023). The LED screens display a virtual environment that has been constructed in preproduction but is rendered in real-time. The film shooting takes place inside the Volume, with the actors filmed together with the environment as background. Unlike with green screens, the computer-generated imagery is not integrated in post-production and thus does not have to be imagined by the actors; it is visible during shooting. Aspects like day or nighttime, or the location of geographical or architectural elements can be changed on set. And since the monitors project their own light, they illuminate the actors' bodies almost realistically. Furthermore, the camera on set is connected to a virtual camera that moves accordingly and transforms the displayed image, thus creating the illusion of a prolongation of the set into the virtual environment. While the camera has to be still in rear projection, in the Volume it can move and create a parallax effect: The background simulates a movement according to its presumed distance.

These technological conditions show in the aesthetics of the series. Most noticeable is the dominance of scenes set in twilight, the early morning or evening, and in overcast weather, rather than in direct sunlight. This is because the monitors light the characters and the LED blocks are rather close to the actors, while the sun would have been much farther away, with its light dissipating on the way to the scene. Scenes with direct sunlight, one can assume, would have lit up the characters too brightly. Dimmed or hindered by clouds, fog or sand, the light appears more realistic (StudioBinder 2023).[4]

4 However, not everything was shot inside the Volume (Industrial Light & Magic 2020), and there are scenes shot in daylight that do not stand out negatively.

Figure 2: The Virtual Production of The Mandalorian Season One. *Source: Industrial Light & Magic. 2020. "The Virtual Production of The Mandalorian Season One." YouTube, February 20. Accessed July 25, 2024.*

The Volume has other limitations as well, mainly as a consequence of it working in the studio environment rather than outside. The camera cannot move more than the angle established by the LED wall, and the actors cannot run far without hitting the wall. These limitations are partially dealt with by slower body movements, which can be easily incorporated within the stoic masculine imagery of the lone wolf cowboy that the Mandalorian instantiates. There are, on the other hand, moments that show off the new possibilities. Not the least among these is the protagonist's helmet: Its high reflectivity means that the world around the Mandalorian is mirrored. This is used narratively in the second episode of season one, in a scene that has two combatants approaching the Mandalorian from above reflected on the helmet, thus foreshadowing the danger to come (see Figure 3). The environment broadcast by the LED monitors gets directly reflected on body parts and helmet, thus projecting the virtual surroundings on them. In the same way, the reflective surfaces of shiny sports cars in racing games—such as *Gran Turismo 7* (2022), which takes advantage of Play Station 5's real-time ray-tracing support—serve as showcases for advances in computer graphics.

The Mandalorian's helmet, however, is not only a projection surface for the computer-generated environment, but for the audience as well. By hiding the concrete physiology and facial characteristics underneath as his culture demands ("This is the way"), the Mandalorian can play the role of a projection plane for the audience's imagination, not unlike an avatar in a video game. The series' structure (referring mainly to the first season of the show) shows connections to video game mechanics as well, especially to role-playing games (RPGs).[5] The story progresses in the form of individual tasks—bounty hunter jobs—that the Mandalorian has to fulfill, like in the quests structure typical of RPGs. The rewards for these tasks are metal ingots that he can use to upgrade his equipment. And, just as players of role-playing games often have to go to the village blacksmith to get their equipment leveled up, the Mandalorian visits a smithy—a Mandalorian woman versed in the old custom of forging Mandalorian armor.

Virtual production is made possible by Unreal Engine, a video game engine and Integrated Development Environment (IDE) that is used for the development of 3D video games. One of the most employed game engines for commercial video game development today, Unreal Engine's first version was developed for the first-person shooter *Unreal* (1998) by Epic Games, now famous for their game *Fortnite* (2017–). Unreal Engine is on the one hand used for creating 3D environments, characters and objects, and implementing game mechanics and other scripts, and on the other hand for rendering these complex situations on screen in real-time, based on player input and game logic. When used in film production, instead of moving to far-distanced shooting locations, a multitude of virtual worlds can be created on computer and displayed inside the studio on the LED blocks.

However, this technology dramatically changes the status of film images. While in the beginning it was film's receptive nature that made it possible to have the outer world inscribed in an image, post-cinematic film images are becoming more synthetic due to this technology. Of course, analog film has many beginnings. And, of the pioneers that are usually named in film history as ideal types of cinema's aesthetic

5 Since many typical RPG elements like quests, skill points, and equipment upgrades have been incorporated by other genres as well, those elements in a way have become video game elements per se.

Figure 3: The Mandalorian*, Season 1, Episode 2. Source: Disney+.*

tendencies, only the brothers Lumière were predominantly engaged in capturing real-world scenes. Conversely, George Méliès used film images as material with which to construct illusions of magic. The films of the often neglected third pioneer, Alice Guy, can also be called synthetic to a degree, since her scenes of everyday life, which can be considered as the beginnings of cinema's narrative tendencies, had to be highly staged in order to present private scenes for a public gaze (Förster 1997). Montage techniques have also created illusions of spatial and temporal proximity among scenes that in reality could have been far apart. And, for a long time, green-screen technology has allowed for the infusion of archived background scenes into new film shootings (Cram 2012). But in all these cases a profilmic reality remained, albeit sometimes in a highly fractured way, and with it a certain spontaneity in the material, for example, in the appearance of something that was not intended or thought of, or that might have been not noticed at all.[6] This resistance of the outer world's materiality vanishes with the creation of models of mountains in 3D object model programs, their placement in the background, and their rendering by game engines.[7] Instead of a "Redemption of Physical Reality," as the subtitle of Kra-

6 Since some of the 3D objects are built with 3D scans or 2D textures of outside world elements, there still might be some trackable real present nonetheless.

7 Of course, there is still a spontaneity of the material involved: pixel artifacts, algorithms not being able to realistically render some materials, like hair, and limitations of the color gamut. But those are spontaneities not of the outside world, but of the inner world of the machine.

cauer's theory of film has it, we are dealing with a construction of an inner reality, be it the machine's or the digital film creators' imagination (Kracauer 1960).

4.2 *1899*

The German Netflix production, *1899*, Baran Bo Odar and Jantje Friese's second collaboration after *Dark*, also employed a virtual production set. The TV show was shot at Studio Babelsberg, Potsdam, in a specially created version of an LED volume called Dark Bay, produced by Bo Odar and Friese's own production company. The set also integrates a revolving stage, thus enabling shots from every angle, and rain-rigs for realistic rain and water effects, which suited the story's environment (Dark Bay 2022).

The series' action takes place on *Kerberos*, a steamship on its way to New York City at the end of the 19th century. The passengers come from all over the world, and the distinction between first- and second-class passengers is made clear. The protagonist is the 30-something years old physician Maura, a brain specialist who is searching for her missing brother. He was on board *Kerberos*'s sister ship, *Prometheus*, named after the Titan associated with the creation of humankind in Greek mythology. The *Prometheu*s vanished in mysterious circumstances, and the crew and passengers of the *Kerberos*—hell's watchdog—soon encounter mysterious events of their own. Among others, they find themselves transported to events from their past that happened in different regions of the world. At first, these scenes are included in the story-like dreams that the passengers wake up from, before going back on deck, or as memories or hallucinations made visible after shots of the actors' absent-minded faces. Later, these environments turn out to be localized on the ship, in rooms beneath the passengers' cabins. They seem to be virtual surroundings produced by a computer simulation. Thus, they mirror the production set of the TV show itself, with the LED volume creating virtual imaginings of an outside from the inside of a film studio (see Figure 4).

Having realized the location of these rooms in the belly of the ship, it becomes possible for some to traverse the rooms of other passengers. Not all passengers, however, seem to be real in the same way. In an episode in the middle of the show's first (and presumably only) season,

Figure 4: 1899*, Season 1, Episode 7. Source: Netflix.*

a ticking signal chimes and many of the passengers and crew members start to move like robots or puppets on deck and start throwing themselves into the waves. Before that, one scene set in the dining saloon of the ship shows everybody except Maura and some waiters simultaneously making the same movement of drinking their cup of tea and putting it back on the table, hinting at a form of synchronization. While some people on the ship thus appear to have agency of their own, others seem to be more like artificial beings. This resembles the distinction between player characters and so-called non-player characters (NPCs) in video games. Furthermore, this element from video games is connected to themes like the creation of man, highlighted by the ship's name, the role of motherhood, which is dealt with in the form of a birthing scene and the loss of children, as well as the god-like father figure of the show's antagonist.

The end of the first season resolves the mysteries of the story in an even vaster computer simulation. The supposedly real-world situation is a spaceship travelling in the year 2099. Maura gets out of a sleeping pod, which she was plugged into next to people whose faces the viewer recognizes as having been on board the steamship. They appear to be connected to a computer system that seemingly produced the 1899 story as entertainment on the flight. But it is highly doubtful that this really is Maura's reality. Not only because the years 1899 and 2099 circle around a time not that far from us that might hide some key to the series' plot, but also because of the way in which names and objects have morphed from the one reality to the other.

Displayed on a surprisingly old-fashioned computer monitor are successive messages seemingly sent by Maura's missing brother Ciaran: "Hello sister. Welcome to reality." The spaceship they are travelling in is called *Prometheus* and seemingly has the purpose of finding a new place for mankind. Several objects also appear to stand in for things already present earlier. This kind of transformation seems to hint at psychological *displacement*, originally conceived by Freud in the context of dreamwork: "a latent element is replaced not by a component part of itself but by something more remote—that is, by an allusion" (Freud 1961, 174). The series displays many elements that seem to be standing in for something else. A magical-mechanical beetle that a mysterious boy is able to make use of, for example, acts as a key for doors on the ship. In a less magical form, the beetle is also part of Maura's dreams or memories. A psychological structure is present throughout the series. As already pointed out, the chambers containing environments from the characters' past are situated beneath their cabins, evoking the (actually mistaken) idea of the unconscious as subconscious (Binotto 2018). And the show starts its first episode with a reflection on the creative potential of the human mind in the form of a comparison between reality and imagination. Over panoramic shots through clouds and over landscapes and oceans, a female voice—presumably that of the actor who plays Maura—is heard reciting the first parts of a poem by Emily Dickinson (2005, 269):

> The Brain—is wider than the Sky—
> For—put them side by side—
> The one the other will contain
> With ease—and You—beside—
> The Brain is deeper than the sea—
> For—hold them—Blue to Blue—
> The one the other will absorb—
> As Sponges—Buckets—do—

The last shot of the ocean's surface shows a vortex devouring the camera's eye and transporting the viewer through a tunnel at whose end a new scene begins. The silhouette of an old man faces Maura, who is dressed in a hospital gown and held back by two guys. When the man, whom Maura addresses as "father," tells her to "wake up!" the show cuts to a close-up of her face, then reveals her to be lying on the bed in her ship cabin with marks of having been restrained on her arms.

Many viewers of the show have criticized it for its shallow one-dimensional characters. And indeed, most of the characters lack interesting development throughout the story, and their back stories have rather simple plot lines. When watched from the perspective of computer simulation and psychological dreamwork, these characters might be seen as mere projections, *condensed* creations of the machine or of Maura's mind, whoever she actually might be.

Psychoanalysis played a strong role in film theory in the 1960s and 1970s, most effectively in the analogy of the psychological and cinematic machine in Jean-Louis Baudry's Apparatus theory, which is indirectly evoked in the show by Maura's father mentioning that she has always been fascinated by Plato's cave allegory (Baudry 1974). Just as the human beings in Plato's cave see the shadows of made-up objects thrown on the wall and think of them as reality, in Baudry's theory, cinema is arranged in the same way: people, forced to sit still in a dark room watch projections of images on a screen, that appear to be real. By highlighting the active role of the viewer, Heide Schlüpmann defends cinema against this criticism, based on her research on female viewership in early film. She describes the constellation of audience and screen in cinema as a juxtaposition of two forms of projection. Scenes from the outside world get projected onto a cinema screen, where they meet the viewers' eyes, while the viewers project their own imagination onto this mediated outside (Schlüpmann 2007, 49). Both projections are connected to reality, be it the experience of the viewers that determine their desires and expectations, or the film material onto which the outside world has been inscribed. Instead of being the purely ideological *dispositif* of Baudry's theory, cinema entails the possibility for the viewer to take an active part, and their scopophilia to get a positive re-rendering.

In the new virtual environment set, however, the outside world has vanished and been replaced by the creations of video artists and GFX experts. Instead of a juxtaposition of outside and inside projections, the audience's projections only meet the projections of the imaginary of others. The real's resistance has been resolved. Like in total reflection, when material specificity and ray angles do not allow light to leave the medium, the projections are kept inside the volume.

Most of the interpretations of *1899* remain speculation, however, since the show was cancelled after one season, its central mystery left

unresolved. As Friese and Bo Odar have pointed out, they had planned a three-part series, mirroring their first collaboration *Dark*, which has been a vast audience success (Wyche 2018). Since Netflix does not publish their access data, its reasons for its decision not to renew *1899* remain a mystery too. But since streaming services sell subscriptions for access to upcoming films and shows, rather than selling films and series themselves, their institutional logic determines that they focus on multiplying new formats rather than keeping already existing shows alive (Hadida et al. 2021).

With the implementation of video game engines for rendering virtual environments, the borders between film and game have become fluid. Since both are based on data structures processed by computer, they can easily be modulated in the same way. Kim Libreri is Chief Technology Officer at Epic Games and thus responsible for the development of the Unreal Engine. Before coming to Epic, he was a technology supervisor in the team responsible for the famous bullet time shots in *The Matrix* (USA, AUS 1999), a revival of Eadweard Muybridge's chronophotography from pre-cinematic times. In an interview with *British Cinematographer*, Libreri states: "[W]e want to show that there doesn't need to be a barrier between industries. If you are a filmmaker and use our engine to make content for an LED wall, then that content can also go into a game, and digital characters created for those experiences can be transferred to other mediums" (Hogg 2022). This creation of digital characters, moving from one medium to the other, is at the heart of the next case study.

5. Digital Characters (SAG-AFTRA)

The year 2023 not only saw the Hollywood's Writers Guild go on strike, but also the Hollywood actors' union SAG-AFTRA.[8] The strike was driven by two main concerns, besides protesting about the appalling payment most actors receive and their frequently non-existent health insurance and social security. The first was the changes to residuals

8 The acronym stands for Screen Actors Guild—American Federation of Television and Radio Artists.

paid to actors for re-runs of TV shows or DVD releases. In earlier times, actors received payment when a show or a film they worked on was shown again, for example, on television. However, the advent of streaming platforms has negated the idea of a re-run, since everything currently available on a service can be watched at any time. The platforms, which generally do not publish the access data for individual shows, thus only pay a fixed sum to actors, and this is much less than in pre-streaming times. This, together with the generally low levels of pay and lack of security, presents an existential risk to actors.

The second concern of the SAG-AFTRA strikers (and those of the Writers Guild) is often described as a fear against artificial intelligence. Writers' fears relate to Large Language Models (LLMs), mostly known in the form of chatbots like ChatGPT, which are often treated synonymously with AI in public discourse. However, the form of artificial intelligence relevant in the actors' case seems to be linked to video games.

One SAG-AFTRA member, Erik Passoja, shared his experience of this form of artificial intelligence on Facebook (Passoja 2023). He was cast in the role of a geneticist for the military first-person-shooter video game *Call of Duty—Advanced Warfare* (2014). As such, his facial expressions and bodily movements were scanned to render his fictional character realistically. In this digitally replicated way, he is present in cut-scenes of the game, which usually serve as a break and/or reward between actual gameplay (Klevjer 2023). While cut-scenes made from live-action film shootings (*Command & Conquer—Red Alert 2* [2000]) or higher definition pre-rendered animated short films (*Final Fantasy VII* [1997]) are still used today (see, for example, the interactive film game *Immortality* [2022], where scrolling through a library of live-action film files basically is the game or the hand-drawn anime cut-scenes in *Fire Emblem—Three Houses* [2019]), today cut-scenes are more often produced in-game. Instead of connecting the game engine's camera to the player inputs, the camera is used to simulate cinematic sequences. The video game characters are scripted to behave in a specific way, the camera to move accordingly. Sequences are edited to imitate movie conventions and, usually, the scenes are voiced. When actors have been scanned to create realistic character models, they typically also voice their characters to increase the simulation of live-action film, as is the case in *Call of Duty—Advanced Warfare*.

The player first encounters Passoja's character, Dr. Danois, in *Call of Duty—Advanced Warfare* at the end of a mission to capture him. He appears as an NPC, hiding behind a desk, with his hands covering his face. By pressing a key to successfully finish the mission part, a scene is triggered in which Danois is beaten up by the player's comrades and tied up in order to transport him. The scene is rendered in real-time, with the player losing control of the camera and movement, resulting in a short uncut sequence with a static camera that the player has to watch. After the mission is completed, a cut-scene shows Danois sitting helplessly at a table in a dark, mirrored room and being interrogated by a private police officer, a trope ubiquitous in TV crime shows. This time, the scene is pre-rendered in much higher resolution, resulting in very realistic appearing character models, and edited to simulate a film sequence (see Figure 5).

Passoja later found out that his visual likeness had been used for the multiplayer version of the game as well. Here, his data was not used for a fictional character in movie-like scripted narrative scenes, but for customizing the appearance of players in multiplayer matches. Thus, he was not only part of cut-scenes, but part of the action itself. One could play as him and moreover one could play against him, making him—this game being an ego-shooter—a target to be killed.[9] He was not informed about this, nor was he compensated for the renewed usage of his data. It was all thought of as having been included in the payment he received for his initial acting job.

In one of the last rounds of talks during the SAG-AFTRA strike, the film companies aimed to establish this procedure as a standard going forward. They demanded the possibility to pay actors for one day of work to scan them for data, which they could then employ freely from that time on. The approach of course has serious economic implications for actors, but it also highlights another fundamental change in post-cinematic images. Instead of real people being filmed, virtual characters might play their roles, thus turning digital films into feature-length video game cut-scenes. Even if this was only used for inte-

9 In contrast to other characters a player can choose from for customization, Passoja's so-called skin is not named after his story character, but "Pas," after the first letters of his actual name.

Figure 5: Call of Duty—Advanced Warfare *(2014).*

grating some NPCs into the background to replace supporting actors, the major film companies would most likely be glad to cut their costs.

The strike ended in November with a tentative agreement that was approved by the majority of SAG-AFTRA members in December 2023. After a general introductory paragraph, "Artificial Intelligence" is the first and longest section of the contract, and includes many distinctions, regulations, and rules for governing the ways in which actors need to be informed, asked for consent, and reimbursed for their "digital replica" (SAG-AFTRA 2023). While these regulations will certainly contribute to the better treatment of performers for their work, they make clear that film production has fundamentally changed and will continue to do so.

6. Conclusion

All the above case studies show how the digitalization of film and cinema has allowed video game technologies and practices to enter film production. This is increasingly blurring the line between film, TV, and video games, and changing the status of cinematic images under current media constellations. The way in which movies and TV shows can

be altered without logistically and financially expensive re-shootings, leads to a potential historicity of digital film that is absent in analog film. When considering the possibilities offered by the potential to revive deceased actors through computer technology, these alterations are way beyond what was present in film before (see, for example, the role of Laurence Olivier in *Sky Captain and the World of Tomorrow* (USA/UK/IT 2004) as an early example). Virtual production sets like Lucasfilm's StageCraft and Babelsberg's Dark Bay are fundamentally transforming the status of the medium from an already declining receptive quality of film to a synthetic approach of pictures as artistic creations. And with the possibilities of scanning actors for data and using this data for virtual character creation, the denominator of so-called "live-action" movies increasingly loses its meaning. The 2023 remake of Disney's animation film *The Little Mermaid* (USA 1989), for example, still feels like, and (more or less) actually is, an animation film after all. Epic Games' Kim Libreri has put this change in the following words: "To me, you know, video games, movies, it's kind of the same thing" (Animation World Network 2019).

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TikTok's Duet Feature: *Produsing* Images in Political Contexts and Beyond

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Abstract

Focusing on the Duet within political communication on TikTok, this study explores its function as a participatory digital practice, or *produsage* genre, that adapts filmic features and tools for a primarily amateur and user-generated video environment. Due to the noteworthy presence of political content on TikTok, a growing number of contributions have been made, primarily from the disciplines of media and communication studies, as well as political science. However, the app's unique digital landscape for political engagement has received limited scholarly attention from the perspective of visual studies, despite their rightful interest in this field.[1] To bridge this gap, this chapter begins with an introduction and then examines a video filmed by Boris Johnson during his tenure as Prime Minister. Building on these insights, it further analyzes a sequence of four Duets by various users to explore collective user impact on images under TikTok-specific conditions. The final chapter reflects on the video platforms' influence on cinematic image production and screening, offering prospects for further research.

Keywords

TikTok Duet, produsage, user-generated content, political communication, visual studies

1 For an overview of scholarly research on TikTok, see Rejeb et al. 2024.

1. Introduction: TikTok and User Participation

Since its expansion beyond China in 2017, the video-sharing app TikTok has loudly asserted its dominant position over other social media platforms (Su 2023). Descriptions like "attention factory" (Brennan 2020) and "one of the most addictive scrolling experiences" (Zeng, Abidin, and Schäfer 2021, 3163) reflect this status. Upon opening the app, users[2] are presented with a seemingly endless feed of video content, the so-called For You Page, that is navigated by scrolling. Between one swipe and the next, users encounter people dancing, engaging in platform-specific practices like lip-syncing, trying on quirky costumes, showcasing flashy makeup, and more (Zeng, Wikström, and Kaye 2022). Initially, many dismissed the platform as a mere entertainment app with short videos aimed at teenagers. However, the range of content on TikTok has since expanded to match the diversity of its constantly growing community. Following a surge in popularity during the pandemic, TikTok's growth seemed immense, yet the platform managed to surpass expectations in terms of user numbers. Globally, between 2021 and 2023, the user base grew by 40 percent to reach a total of 1.9 billion, with trends indicating further increases (Ceci 2024).

One of the key reasons for the platform's success and its expanding economy is the active participation of users. Even if they do not belong to the group of TikTokers who create user-generated content (Shutsko 2020), users do not merely engage in passive consumption of content through visual and auditory reception;[3] they become notably physically active by interacting with human and non-human entities through the touchscreen. As the interface allows users to utilize the

2 To differentiate the roles assigned to human actors regarding the app, the terms are used as follows: "creators" and "TikTokers" are active content creators; "users" are undifferentiated actors, encompassing all those interacting with the app in all ways possible.

3 The auditory perception of content is discretionary. TikTok is continuously experimenting with various modes of sound reproduction. Initially, upon opening the app, the sound was automatically set to "on," with the sound thus dominating the image as argued by Crystal Abidin (2021, 79–80). In 2023, the sound was muted by default for a period and had to be manually activated, so that priority was given to the image. As of May 2024, users are required to configure their profile settings if they prefer TikTok to open with sound muted.

platform's numerous *affordances*,[4] they engage in relational practices (Otto 2023, 20) such as swiping, liking, commenting, saving, sharing, and, more significantly for the current discussion, re-creating content already posted online. This creative practice, where original works[5] are transformed into novel artifacts, was termed *produsage* in media studies during the early 2000s (Bruns 2007; Bruns 2008). Formed from the words "production" and "usage," *produsage* was used to define the then-new model of content creation as a hybrid form. The concept has been updated since (Bruns and Schmidt 2011; Alomran 2022), but it was not applied to TikTok and specifically its image until my recent contribution (Pawlow 2024).

Although users have the option to scroll through the app limitlessly without becoming TikTokers, the platform encourages them to contribute to the content pool by reworking pre-existing content, thereby participating in the platform economy (Otto 2023, 15; Maris, Caplan, and Thach 2024). This encouragement is facilitated by the remarkably user-friendly video production and editing tools, which, owing to their intuitive and mobile design, swiftly integrate into the digital literacy repertoire of users (Arafah and Hasyim 2022, 2493–2495). Users, hence, can participate in content recreation with just a few screen touches, with two essential genres of *produsage* on TikTok being the Stitch and the Duet. The Stitch feature allows users to select a short segment of another user's video and insert it at the beginning of their own video. In contrast, the Duet feature enables users to react to an existing video by playing their own video directly alongside the original—a practice that is often used for expressing opinions and criticizing political figures and events, as suggested by the example addressed in this contribution.[6]

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4 Gibson (2015, 119–120) defines the self-invented term as follows: "The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill."

5 The notion of originality in terms of a work's distinguishing uniqueness can be called into question for each individual video. However, in using this term here, the intention is to linguistically differentiate the first uploaded video from the reworked videos within a chain of *produsage*.

6 I would like to thank Daniel Pfurtscheller for bringing this video to my attention during the Dresden conference "Memefication and Performance: Interdisciplinary Approaches to the Video Platform TikTok" in 2023.

2. *Produsing* Through Duetting: Political Images on TikTok

2.1 Selfie-Johnson: Levelling Up

On May 10, 2022, the account @10downingstreet posted its first video on TikTok. It went viral, accumulating nearly four million views and over 45,000 comments.[7] Named after 10 Downing Street in London, the official residence and office of the British Prime Minister, commonly referred to as "Number 10," the account featured Boris Johnson addressing the public on TikTok (Figure 1). In this 41-second clip, Johnson explains what viewers can expect from this account and how it differs from other social media:

"Hi folks, this is Boris Johnson here, launching the Number 10 TikTok site. And you won't necessarily catch me dancing on this site, but we will have all sorts of stuff about what we are going to deliver on our priorities, deliver for you on our agenda of uniting and levelling up our country. And you'll get all sorts of messages and content that you might not get if you're looking at Instagram, or Snapchat, or Facebook, Twitter, LinkedIn, and all the other stuff. This is intended to be a place where we can put out messages and behind-the-scenes insights into what we're getting done. So, tune in to Number 10 TikTok!"[8]

For the first three seconds of the video, white text on a black background appears in the upper left corner, stating "Welcome to Number 10/TikTok," thereby introducing the subject of the post. Johnson records his speech using the right hand to hold the smartphone. His left hand is once shortly visible within the vertical frame, known as portrait format. In addition to that, the somewhat wobbly camera indicates affirmative gestures off screen. Johnson, whom we see in a medium close shot, is dressed in a white shirt, a dark blue blazer, and a matching patterned tie. His straw-blond hair appears disheveled as usual. Behind him, one can discern a room with mainly white walls, a painting, and a window to the left behind Johnson. To his right, a wall in dark blue contrast the interior. The presence of a visible edge of a

7 The video can be accessed without registration online via https://www.tiktok.com/@10downingstreet/video/7096051570969726214. Accessed May 15, 2024.

8 My transcription from the video. Further quotes without references are sourced from this transcription.

Figure 1: @10downingstreet: Screenshot of the original video posted on 10 May 2022. Accessed April 23, 2023.

wooden table and a table lamp positioned behind the politician suggest that he films within a workspace, presumably one of the offices in 10 Downing Street. Situated between the tradition of state portraits, representations of labor and the selfie, the described video draws upon existing political iconography and demonstrates how the smartphone and a social media platform can assume the role of conveying content that *is meant* to be socially influential (Krass 2019, 346; Bredekamp 2022, 25). These unique features of Johnson's/@10downingstreet's video contribution and their implications are the focus of this chapter, serving as an essential foundation for understanding the Duets *produsedd* from it.

To contextualize the video image, it is worthwhile to take a brief look at the tradition of state portraits. Whether depicted in full or half-body, or on a horseback, a sovereign was portrayed not as they are, but as they should appear, with an earnest expression, a dignity of movement, and insignia as accessories of power (Olausson 2002a; Olausson

2002b). Adequate clothing, too, played a major role within this representation. The French Revolution marked a significant change in how fashion was used to symbolize the separation of the aristocracy from the common people, leading to the adoption of a republican official dress. Gradually, many states followed this example, reflecting their own values through clothing choices (Dogramaci 2011). The 20th century saw the suit rise in prominence, at least within European and subsequently oriented dress codes. A symbol of the middle class, this attire represents the republic and, by extension, democracy (Agulhon 2003; Boude 2003; Ellwanger and Müller 2002). Present-day European politicians like Boris Johnson usually opt for a dark suit paired with a white shirt and tie. Any deviation from this "workwear" sparks controversy. For instance, a filmed appearance by Andrea Nahles, Horst Seehofer, and Olaf Scholz after the meeting of the coalition committee in Berlin in July 2018 was interpreted as exhaustion after long debates or a decline in standards, as both men omitted their ties and unbuttoned their shirts' collars (Roetzel 2018). However, disregarded etiquette could also be seen as a signal that more pressing matters demand attention, requiring politicians to fully immerse themselves in their work.

A deliberate deviation from the dress code, however, is not the only way to stage political labor. An alternative method involves representing typical political activities, which may include administrative and intellectual work, and the challenges and efforts they imply. In 1975, President Gerald Ford appeared before television cameras with two aides who handed him documents. To create the perfect image of a working president, he gestured energetically and forcefully against the backdrop of the White House library (Henley 1977, 124–125). A more recent example is presented by a poster from the 2021 German federal election campaign. Christian Lindner, leader of the FDP, was depicted on the large horizontal poster leaning over a document as he writes. Surrounding him are stacks of folders. A desk lamp, casting light from off-screen, suggests that the politician not only works tirelessly but also does so into the late hours: "Nie gab es mehr zu tun (there has never been more to do)," underscore the pink letters on a yellow background against an otherwise black-and-white image. In the different versions of the poster, the slogan is strategically positioned either directly over the politician's chest or at a comparable

level.[9] The text thus speaks *for* the politician, who himself must not be distracted from his work for Germany and its citizens. As a result, the viewer of the poster, who appears to be pushed into a position of silent observation, gains a seemingly intimate insight into political work (Jacobs 2022, 67–68). This suggests transparency and closeness to the people, two essential aspects that Boris Johnson also seeks to convey to his TikTok audience. However, the means he employs are entirely different from Lindner's, as I will demonstrate further.

The space where Johnson records his video builds upon the trope of politicians at work in their office (Jacobs 2022, 71). Despite the lack of typical work-related attributes, the dark royal blue or imperial blue walls signal an association with the aristocracy and the British royal family. This color, alongside white walls, reflects notions of peace, friendship, reliability, trust, and stability (Pastoureau 2001, 179–181; van Braam 2024a, van Braam 2024b), underlining a productive atmosphere where efforts are being made to "deliver," as stated by Johnson. The use of selfie mode supports the determination for action and busyness. As a medium of participatory culture (Jenkins, Ito, and Boyd 2016, 1–31), selfie recording is a social practice that involves not only photographing or filming oneself but also sharing the result with the public (Murray 2022, 1). Thus, the selfie is characterized by extreme immediacy (Gojny 2016, 16–17). This quality of the selfie can be effectively utilized in political communication by "charismatic" leaders who rely on authority rooted in extraordinary personal qualities, skills, and behaviors, in contrast to legal and traditional (inherited) authority (Abidin 2017).[10] Thus, the selfie's immediacy enables establishing a connection between the filmed person and the audience. Filming himself in a medium close-up, the Prime Minister invites the user into his personal workspace. As he looks into the camera, he employs the gaze as a powerful means of intimate communication. Since looking supposedly involves more than one agent, the politician's gaze seeks to capture the viewer's gaze in return (Sturken and Cartwright 2018, 103–109). Once the eye contact is established, the Prime Minister

9 The first version mentioned was also used as the closing shot in the official campaign video, which is available at https://youtu.be/ADq6Hmvx5cA?si=c0qBORdib0cxGsZm. Accessed May 17, 2024.

10 Charismatic authority or leadership is a concept that was coined by the German sociologist Max Weber in the 1920s (Utz 2020).

seems to speak directly to the app's users as individually addressed at the other end of the "line." Thus, the glimpse into Johnson's office appears even more intimate than the depiction of Christian Lindner at work. There are no desks or papers dividing the viewer's space from Johnson's as he communicates face-to-face. Unlike the yellow-pink slogan in the static poster, the fading "Welcome to Number 10 TikTok" text provides the audience with an unobstructed view of the Prime Minister, who becomes literally palpable as an image object[11] via the touchscreen. Altogether, this creates a sense of presence and closeness, as viewers feel connected to the moment in which the selfie was taken, or in other words: "My (hypothetical) selfie I produce only for your gaze and hence also for *your* time" (Raymond 2021, 5–6).

In Johnson's video, this impression of contemporality is intensified by the one-shot recording. This form of uninterrupted self-recording became popular among TikTokers especially during the lockdowns. Content creators started sharing their daily life stories on the go, as if "talking" to a diary, archiving their experiences using hashtags such as #storytime (Conley 2021, 271–273). This filming mode, which can be defined as a form of subjective shot, significantly enhances the sense of social presence and immersion (Wang 2020, 7–8). Additionally, it increases the perceived authenticity of the image, which in turn reflects on the spokesperson and their message. This effect is reinforced through the movement of the video-selfie, which, in return, leads to "flaws" in lighting and focus, particularly evident when Johnson turns the camera towards the window.[12] In research, these disruptions are discussed under the term *snapshot aesthetics* and are interpreted as staged spontaneity (Schroeder 2010). Circling back to depictions of labor, it is this effect that conveys urgency. The Prime Minister, it seems, does not have time to attend to scripted speeches and meticulously staged images like the German FDP poster presented above. On the go, the politician's bustling is synchronized with the movement of the camera he holds, a mobile device he will soon stow away in the pocket as he

11 Bildobjekt as characterized in the visual theory by Pichler and Ubl (2014, 20, 154).

12 The opposite effect can be observed, for example, on social media platforms like Instagram, known for their curated aesthetics in the image Grid. Despite the introduction of Reels, inspired by TikTok in 2020, snapshots and their aesthetics are primarily confined to the self-deleting Stories on this platform.

resumes his duties serving the British citizens. The promised insights are meant to be a testimony, mediated by the image of what is "getting done," and are exclusively available to TikTok's community. After all, not everyone gets to follow the Prime Minister on his journey of "uniting and levelling up." Those who do, experience him as a transparent and authentic man of action.

Consequently, the self-filmed appearance in a Number 10 office is meant to reinforce a multifaceted representation of the Prime Minister. It is marked by an ambivalence between a busy government official, yet an approachable member of the British community who finds time for its citizens; between a serious, appropriately dressed politician and someone who, despite potential image setbacks due to their wild coiffure, must pave the way for an independent mindset and the innovative solutions it entails (Anthony 2023). In 2022, this readiness for novelty included TikTok, which may seem daring because of the app's enduring comic connotations (Schellewald 2021, 1443). Its use has yet proved effective, particularly for populist political communication, as determined by a pioneering study conducted during the US election campaign of 2020 (Medina Serrano, Papakyriakopoulos, and Hegelich 2020). A study from Spain, using the example of the party Podemos, confirms these findings (Cervi, Tejedor, and Marín Lladó 2021). It furthermore demonstrates how the application of TikTok tools (music, texts, stickers, and special effects) successfully blends politics and entertainment into mobile *politainment* that is expected to globally increase (Cervi, Tejedor, and García Blesa 2023, 213). This communication form has a significant impact on whether citizens view participation as worthwhile and whether politicians earn their trust (Eilders and Nitsch 2020, 2). That is why Johnson cautions against attributing unprofessional intentions to him with the use of the platform, stating, "you won't necessarily catch me dancing." Could the politician have known at that time that, against his claims, he would be seen dancing on TikTok thanks to the participatory image production via Duet?

2.2 Duet-Johnson: Levelled Down

The use of selfies has become an integral part of politicians' communicative strategies, conveying accessibility and relatability as demonstrated by various analyses (Farci and Orefice 2015; Kaur and Verma 2020; Starita and Trillò 2021), even before the video took over social media. The above discussion makes it clear that Boris Johnson left no stone unturned in using the TikTok video (and those that followed) as a vehicle for arousing sympathy and approval. It was meant to capture the "spirit of the times," and thereby the spirit of the (prospective) voters, both in terms of content and medium. Contrary to these intentions, however, this image politics proved ineffective, as evidenced by the predominantly negative video comments questioning the Prime Minister's competence.😂😂😂😂 "Pmsl [pissing myself laughing] on there [sic!] priorities to keep the rich rich and the poor poorer than ever," commented Tanisha Sidgwick on June 26, 2022. Referring to Johnson's video statement, this user summed up the main criticism of his "agenda of uniting and levelling up" and its public perception as another empty promise unlikely to be achieved (Telford 2023).

To understand the flood of such negative responses to the video, it is crucial to briefly clarify the societal and political backdrop against which it emerged. With his "agenda of uniting and levelling up" the country, Boris Johnson points to the central Conservative manifesto promise in 2019 during the election campaign. It resulted in his tenure as Prime Minister of the UK from July 24, 2019. As outlined in his Levelling Up Speech on July 15, 2021, the shortly thereafter rebranded Department for Levelling Up, Housing and Communities[13] was intended to actively address inequalities between British regions as well as social groups in areas such as the economy, health, education, and safety. This extensive project included a series of measures, Brexit being one of them, that faced criticism even before their implementation (Shearer, Shepley, and Soter 2021). The crux of the issue was Johnson's fundamental idea about *how* to achieve these improvements, as reflected by the term "level up" that he explains in his speech:

13 Previously known as the Ministry of Housing, Communities and Local Government.

> … let us be clear about the difference between this project and levelling down. We don't want to level down. We don't want to decapitate the tall poppies, we don't think you can make the poor parts of the country richer by making the rich parts poorer and you can't hope to stimulate growth around the country by actually constraining companies from developing … (Johnson 2021)

The discussed TikTok video was created only about four months after the official White Paper was published on February 2, 2022, detailing Levelling Up measures. The policy was yet again criticized for being old-fashioned and lacking definition in terms of plans for delivery and funding (*The Economist* 2022; Islam 2022). As the opposing voices grew louder, Johnson's attempt to reach another, particularly younger audience through TikTok seemed like a final gasp for air. Given the substantive weaknesses of the Conservative agenda, his contradictory self-representation fell into disrepute once again: "Each act in his [Johnson's] political career has seen an ideological emptiness filled with self-promotion" (Jenkins 2022). On July 7, 2022, just under two months after the account's launch, Johnson announced his resignation as party leader and Prime Minister, which took effect on September 6, 2022, with the election of his successor Liz Truss.

The negative criticism, as seen in the comments, is visually reflected in a loop of TikTok Duets. These video responses emerged shortly after Johnson's posting on @10downingstreet. Through these visual interactions, it becomes evident how the internal image of a politician and his body translate into external images within a participatory digital framework. Simultaneously, the Duets crafted by TikTok users illustrate how external images can influence internal ones. This reciprocal relationship between internal and external images (Stiegler 1996; Belting 2011, 4–5), is pivotal for my subsequent analysis of TikTok's Duet function as an attempt to collectively reconstruct a broader narrative by reassembling the selfie into an image of the complete body (Busetta 2019, 196). For this purpose, I will briefly describe the practice of Duets on TikTok, and then proceed to examine the peculiarities of the present case study.

TikTok's Duet function is distinguished by its simultaneous depiction of events with a usually visible spatial division. Additionally, the format is automatically identified by the hashtag #duet in the video's description. An automatic linking to the duetted video enables other

users to trace the loop. For the moment, the app provides four modes for Duets. Among them is the Green Screen Layout, wherein the largest object in the frame, for example one's own portrait, is separated from the background and superimposed onto the original video. Evidently, this Duet mode bears resemblance to the cinematic matte shot technique. The second mode involves the Picture-in-Picture technology, where a scaled-down version of the user's vertically framed video is overlaid on top of the duetted video. Like in the Green Screen Layout, the user can freely position this image within a designated frame on the interface. The other two modes are Split Screens. One that places the creator's video to the left or right alongside the duetted video. A second mode fills the phone display, positioning the new video below the original, which results in a horizontal split across the middle. Such composite images have been a familiar feature in cinema for many decades. Filmmakers, both in the digital age and previously in the analog era, have utilized them to create meaning and suspense not only through narrative but also through imagery. These editing techniques evolved on TikTok into an easily practicable form of mobile video *produsage*, as explained in the introduction. Its success is evidenced by the quick adoption of similar *affordances* by other platforms supporting the video format.[14]

The loop of reproductions of the original video on @10downingstreet, analyzed here, employs both vertical and horizontal split screens to terminate in a vertical, screen-filling image. The first Duet, posted by @mrflys, emerged just a day later, on May 11, 2022 (Figure 2).[15] Mr. Flys "enhanced" the Prime Minister's digital body by adding a right arm and a hand using the vertical split screen. Viewed in isolation, the hand depicted by Mr. Flys would appear as a motif, anonymous and interchangeable, yet emblematic depending on the context (Becker 1992a). Through framing, appropriate clothing choice, and movement matching the original video's sound, the addition, however, unmistakably references the original video. The black sleeve of a suit and the sleeve of a white shirt peeking out from it connect to the portrayal of

14 For instance, Instagram introduced the so-called Reels Remix feature in early 2021, earning the title of a "copycat" (Carman 2021).

15 The video can be accessed without registration online via https://www.tiktok.com/@mrflys/video/7096504898941930757. Accessed May 23, 2024.

the politician in his workwear. Vivid gestures of the hand accompany the information transmitted by Johnson's speech, tying the extremity to his body. Nevertheless, the vertical split that visually identifies the Duet underscores the added hand's rhetorical ability. Proclaiming presence of a novel element, it channels the viewer's attention towards the "tools of all tools," as the hand was appreciated by Aristotle in *De partibus animalium* (Oelmann 2001, 462). But what is its intended message?

A series of gestures, the different hand movements in the Duet appear in relatively quick succession. The first gesture shown is an open palm used for greeting, which gesturally emphasizes Johnson's verbal greeting ("Hi folks") and the "Welcome" expressed by the added text. It is followed by a pointing index finger and a fist, which repeatedly appear when the Prime Minister speaks of "uniting and levelling up." These two hand gestures are particularly symbolic. Pointing with the index finger can be interpreted as a gesture that indicates the presence of individuals, objects, or even forces (Becker 1992b). When directed at a specific person, this gesture can appear affirmative or even aggressive, depending on the accompanying context. An iconic example of the latter is the 1917 poster "I want you for U.S. Army" by James Montgomery Flagg (Springer 2011, 443). Applied to the situation depicted in the analyzed video, the raised hand in the pointing gesture symbolizes "levelling up" and the associated call to action (Diers 1997, 184). This is also true for the fist, which, as a representation of concentrated power, has proven to be a highly evocative symbol of initiative (Heusinger 2011). In the Duet, the fist, like a "striking hammer," seems to affirm the promise "to deliver for you" and simultaneously calls the addressed viewers to join the fight for unity. Thus, both hand gestures can be interpreted in the context of Mr. Flys' duet as expressions of action, identifying the person equipped with these "tools" as a *Homo faber* (Flusser 1993, 51).

At this point, these hand gestures do not cast the politician in a negative light; on the contrary, they support his video message. Hence, we must refine our awareness of other hand gestures to find the negative comments reflected in the Duet. One example is a shaking motion of the palm that appears with the word "dancing." Despite its brief duration, the so-called shimmy makes a powerful impression. A dance movement of its own, it is characterized by the rapid shaking or vibrating of the body. The shimmying hand thereby becomes the visual

Figure 2: @mrflys: Screenshot of a Duet video posted on 11 May 2022. Accessed April 23, 2023.

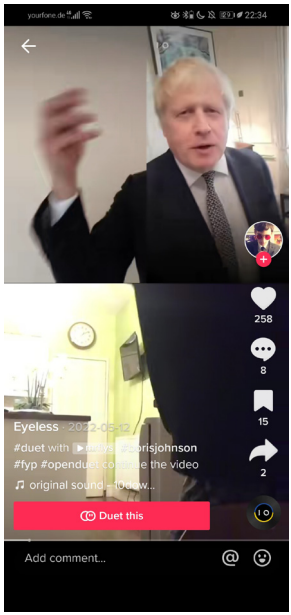

Figure 3: @eyeless.studios: Screenshot of a Duet video posted on 12 May 2022. Accessed April 23, 2023.

pars pro toto of the dancing body, which assumes the crucial role of mediating a variety of messages on TikTok, including political ones (Cervi 2021, 200). Contradicting Johnson's original statement, the hand shimmy creates a comedic effect through incongruity as it steps outside the acceptable boundaries of political iconography (Shifman 2014, 79). The humorous impression is reinforced by additional gestures that no longer bear any substantive reference to the speech. One of them is the so-called sign of the horns, a hand gesture characterized by extending the index finger and pinky finger while keeping the middle and ring fingers folded down toward the palm. As depicted in Mr. Flys' Duet, this gesture is frequently accompanied by an outward-facing palm, characteristic of the symbol of enthusiasm and musical appreciation prevalent in rock and metal culture. Just after the sign of horns, Mr. Flys aka Johnson rotates the index finger around his head, suggesting foolishness.

The enumerated comic hand gestures diminish the impact of initially serious symbols, such as the pointing hand and the fist, through exaggeration and humor. Thus, Mr. Flys' Duet can be situated within the tradition of satire, a practice employed since ancient times for political commentary and resistance. With the deliberate use of humor intended to attack the original content, these comic hand gestures metaphorically "bite" and "stab" to expose the subjects' shortcomings and undermine their value (Elliott 1961, 281; Kreuz and Robert 1993). However, if one were to scale Mr. Flys' visual critique of Boris Johnson's video and consequently of his persona, it appears to be rather innocent. In contrast, a follow up Duet by user @kaypo_ on May 15, 2022, presents itself as a grotesque inversion of all accepted norms (Berger 2014, 61). Kaypo_ becomes part of the loop by duetting @eyeless.studios' Duet (Figure 3).[16] This user, in turn, utilized Mr. Flys' duet to give Johnson's (so far) one-armed torso the right underside. Noteworthy, this horizontally split Duet made an important contribution to the reconstruction of the politician's body, which will be discussed in more detail later. But first, let's return to the third Duet in the series.

Kaypo_ contributed to the video collage by adding Johnson's left side of the body, extending approximately to the knee, aligning with the preceding Duet by @eyeless.studios. Thereby, viewers are presented with a medium-wide shot showing the politician nearly in entirety (Figure 4).[17] While Mr. Flys' duet did not introduce objects into the frame that would conspicuously alter the content of the original video, Kaypo_ adds attributes that initiate a new chain of associations. These objects consist of two liquor bottles "handed" to the Prime Minister by the TikToker. As a result, the serious politician, already ridiculed by Mr. Flys and Eyeless, transforms into a partying Johnson, emblematic of his numerous missteps in nightlife. Previously dismissed with a weary smile, the Partygate scandals surrounding the lockdown parties held at Number 10 in 2020 and 2021 reached their climax. Conducted investigations culminated in a report fully released on May 25, 2022, which contributed to Johnson's resignation. Kaypo_ also brings attention to

16 The removal of this Duet occurred due to the user's deletion of their account. Thus, my analysis of this Duet relies on screenshots taken earlier, although limited by their static nature.

17 The video can be accessed without registration online via https://www.tiktok.com/@kaypo_/video/7097738524073430278. Accessed May 23, 2024.

another social concern: the issue of LGBTQ+ conversion practices that Johnson and his predecessor attempted to outlaw. In the Duet, this isn't explicitly depicted through visual elements but rather through their absence, as noted by the TikToker in the video description: "I had to remove my pride flag from the background for accuracy."

Through his visually and textually intertwined jabs, Kaypo_ highlights two issues for which the Conservative party in general, and Boris Johnson as its then-leader specifically, have been criticized. Thus, the user's duet reflects pressing socio-political questions. Meanwhile, the final duet in this sequence focuses more on the content of the original video but reverses its statement. Boris Johnson, who promised not to dance on TikTok, is made to dance by a pair of bare legs wearing black socks. @r0ad_k1lll, who duetted Kaypo_'s video on the same day it was posted, concluded the vertical 9:16 format and with it the politician's body by positioning her horizontal frame beneath the other four Duets (Figure 5).[18] At the beginning, the viewer observes a hesitant shifting from one foot to the other, with toes pointed inward. The subtle crossing of the legs and gentle, self-conscious rubbing of one foot against the other suggest an expression of shyness. After approximately 30 seconds into r0ad_k1lll's Duet, the legs begin performing a dance resembling a slowed can-can, characterized by rhythmic leg kicks. Both types of movement, the shifting from one foot to the other, and the can-can dance, align with the overall smooth-skinned appearance of the legs as female. As an isolated body part, their depiction demonstrates a high degree of gender-specific stereotyping. Usually subjected to the male gaze as objectified body parts that arouse erotic fantasies, female legs have become iconic in art and film history (Beuth 1993). A framed bodily detail, like in the Duet, they often appeared gigantic and overwhelming, particularly to men (Fleig 2001, 485–486). After all, who hasn't felt threatened by their allure, like Fellini's poor Dottor Antonio (in *Boccaccio '70*, 1962), who must succumb to their erotic temptation?

In r0ad_k1lll's TikTok Duet, the desire for the wholeness of the female body, along with its autonomous agency, becomes particularly evident. Anatomically, the legs are counterparts to the arms as the feet

18 The video can be accessed without registration online via https://www.tiktok.com/@r0ad_k1lll/video/7098067995506838789. Accessed May 24, 2024.

Figure 4: @Kaypo_: Screenshot of a Duet video posted on 15 May 2022. Accessed April 23, 2023.

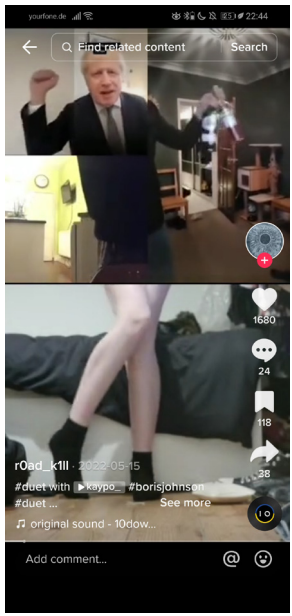

Figure 5: @road_k1lll: Screenshot of a Duet video posted on 15 May 2022. Accessed April 23, 2023.

to the hands. Yet, in this example, they are initially portrayed in a stark contrast to the other body parts, as if they were part of a whole, though not yet united. The original video conveys determination and action, both ridiculed by Mr. Flys through vivid gestures. With the addition of Kaypo_, the overall atmosphere shifts toward a cheering party mood. Both videos contradict the slow, shy movements of the legs and feet. With the dance towards the end of the video, however, the lower extremities finally match the energy of the other Duets, thus completing the bodily collage. Moreover, serving as the driving force of the human body, the legs seem to take control. Even the massive and focal center of the body, the torso, whose movements previously seemed undefined, now appears to be involved in the dance, albeit not determining it (Deufert and Evert 2001). Can r0ad_k1lll's addition thus be interpreted as a critique of the misogynistic conservative leadership that came to light prominently during the Johnson era? Given that the legs occupy

half of the image in the Duet, while the other four videos must share the remaining half, this assumption seems justified. Not only do the woman's legs create an absurd contrast with the rest of the fragmented body of the male politician, thus parodying the male gaze through interruption of heteronormative ways of looking split between the active male and passive female (Mulvey 1975, 11), they also push the satire of the Duet loop to the limit as they dominate the space, and thereby assert their (female) right to participate in society on equal terms. In considering this final compilation, additional questions arise: Is there an overarching meaning behind the collective video mashup? And how does the constructed image relate to the depicted body in its singular and plural constitution?

Johnson's digital body emerged akin to Frankenstein's monster, amalgamating from various external and internal images that were *produsedd* into the Duets through imitation, replication, and recontextualization characteristic of TikTok (Shifman 2014; Zulli and Zulli 2022; Meier-Vieracker 2023). Using the platform's *affordances*, each user loaded a part of their body with various associations, worries, and criticisms, then "lending" it to the Prime Minister's for completion. The herewith reconstructed image of the head of state thus reflects the desire to actively construct full meaning about medially fragmented political, social, and gender issues (Gamson et al. 1992). The act of its creation formed a digital resonance space (Warnke 1992, 50), or, in other terms, a locus of images (Belting 2011, 40) determined by the Duet loop. Within this space, the population's diverse criticisms and ridicule towards the now unpopular politician could be discharged through texts and images. However, while written comments merely listed statements directed *at* the Prime Minister, represented by his digital portrait, each Duet—and there were many more than those presented here—gradually undermined the efficacy of the meticulously constructed selfie of a charismatic leader. Consequently, the presented self-image escaped his control, transforming into an other-image. The collaged Duet now serves as an exemplar for all existing images of Johnson. The pieced-together narrative of a failed politician, transitioning from the video-selfie's self-drawn *Homo faber* to a collectively constructed *Homo ridiculus* (Berger 2014, 61–81), manifests here even before the Prime Minister's official resignation—for the viewers' entertainment.

Furthermore, the cooperatively generated digital caricature, akin to drawing and photography, appears to dissolve into the real body of the politician, serving as a carrier or medium of his own image (Raulff 1984, 46). The populist icon with disheveled hair has hence been stripped of its own iconicity and "levelled down" by society into an "ordinary" citizen who feels the consequences of his own political leadership. As I write this article in May 2024, headlines pour in about the former Prime Minister being turned away at a polling station in South Oxfordshire. Ironically, the reason was that he did not have a valid ID. A rule that Johnson himself introduced in 2022 after famously stating in 2004, "If I am ever asked, on the streets of London, or in any other venue, public or private, to produce my ID card as evidence that I am who I say I am… then I will take that card out of my wallet and physically eat it in the presence of whatever emanation of the state has demanded that I produce it" (Johnson 2004). His ballot paper was not accepted, and no opportunity was missed to mock him. His sight, it seems, now evokes in the memory of the British people the image of a comical chatterbox who does nothing but make empty promises. (He never ate his ID.)

3. Quo Vadis? A Concluding Note on TikTok and the Post-Cinematic Condition

The analyzed example demonstrates how user-generated moving images mediate social relations among people, catering to the entertainment desires of our "society of the spectacle" (Debord 2014) through *produsage*. Connecting approximately two billion users on TikTok alone, these images significantly influence our perception and thus have long penetrated the realm of the cinematic image production and screening.

A notable trend emerging, yet under-researched, involves the segmentation of movies, series, and TV shows into shorter clips shared on TikTok and similar platforms. These segments are reposted, stitched, duetted, and otherwise modified, blending original filmic content with platform-produced material. TikTok responds to this trend by adjusting length restrictions for recordings and uploaded videos. Furthermore, it

experiments with screen formats, such as introducing a YouTube-like 16:9 mode, recommended for videos filmed in landscape mode. This adaptation allows the platform to effectively integrate various mainstream media and explore their success within its own platform economy. For filmmakers, the use of these clips raises critical questions about copyright, but also aesthetics, narration depth, and character portrayal. Despite these concerns, the short video format offers an important benefit as it can reduce barriers to entry. This is achieved through more easily consumable content compared to full-length films and the potential for relatively anonymous real-time engagement with fellow viewers via the comment section. Such interactions foster novel perspectives on the content and enhance a sense of community without requiring viewers to leave their living rooms (Movieguide 2023).

Responding to this changed landscape of viewership, some filmmakers are already exploring social media's viral and mobile potential. For example, viewers of Craig Robinson's series *Killing It* were granted early access on TikTok and YouTube before its debut on the Peacock streaming platform. Other industry professionals such as the Kazakh-Russian director and producer Timur Bekmambetov have started creating formats *exclusively* for social media streaming. In 2019, he launched the ten-episode series *Dead of Night* for Snapchat, exploring the immersive and participative potential of smartphone ScreenLife through features like the subjective selfie camera and viewer comments, particularly within the horror genre. American filmmaker Jon Bass adapted mobile filming for TikTok with *Carole & Grey*, which has been released in 45 segments on the eponymous account since February 5, 2024. The black-and-white videos, clearly borrowed from the cinematic tradition, suggest that they are not merely amateur footage. However, the immediacy of the vertically shot iPhone images align with the platform's aesthetics, giving the impression that much of the film was created spontaneously on location rather than being scripted—as TikTokers usually do, one might believe.

These examples illustrate how the cinema can be relocated to mobile devices (Casetti and Sampietro 2012; Casetti 2012), and vice versa, creating new dynamics and synergies through remediation and adaptation yet to be illuminated in depth by further research. Rather than being a trend to be avoided, the vertical, mobile, and short video capitalizes on technological advancements and the embodied pleasures

of smartphone use. It disrupts traditional visual paradigms, thereby establishing a new visual aesthetic for mobile-based moving images (Ryan 2018, 12–14). For this reason, the post-cinematic video, despite cautionary voices, does not appear to challenge traditional cinema or bring about its demise, because this is not an either-or scenario. Watching a movie on mobile devices, whether remediated or made for it, still differs from a cinematic experience (Beugnet 2022). Hence, as recent research has repeatedly observed (Chateau and Moure 2020, 14), the post-cinematic moving image oscillates between the enduring cinema dispositif and new methods of creating and understanding film, as well as its mode of operation in the postmodern cultural contexts that ensure cinema's survival.

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