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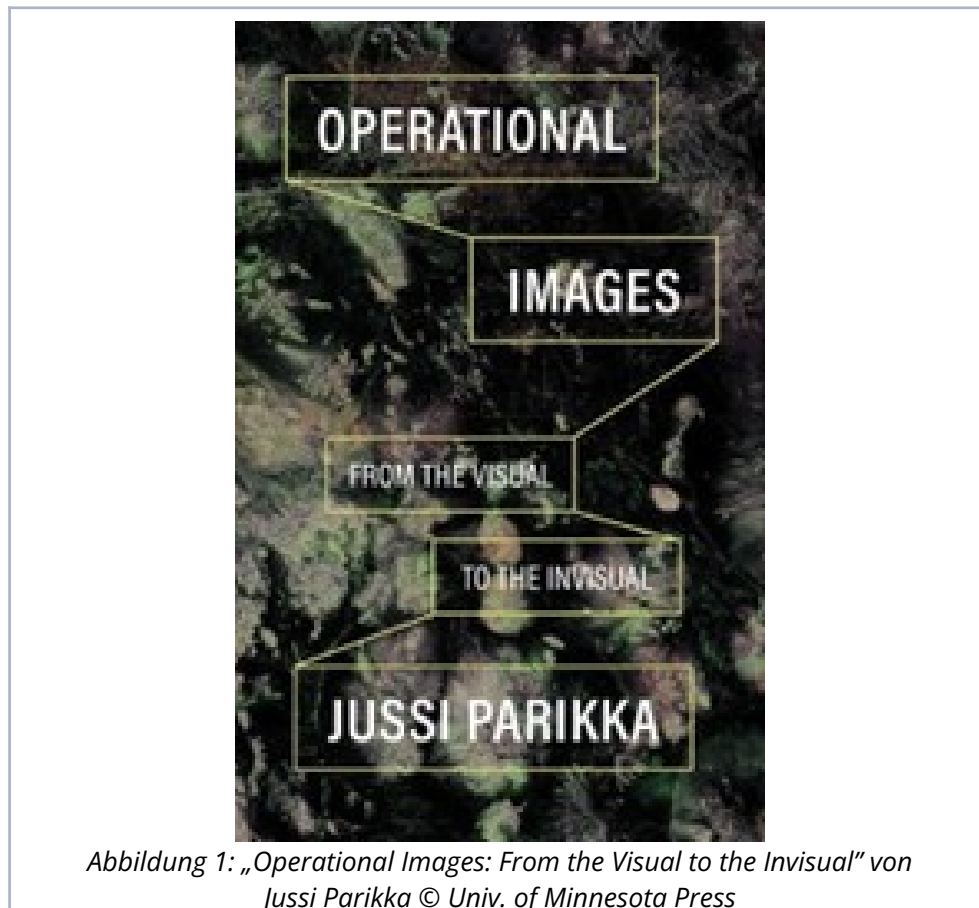
## Rezension: „Operational Images: From the Visual to the Invisual“ von Jussi Parikka

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*In seinem grundlegenden Beitrag zur aktuellen bildwissenschaftlichen Diskussion *Operational Images: From the Visual to the Invisual* beschäftigt sich der finnische Medientheoretiker Jussi Parikka mit den Veränderungen im Verständnis und Gebrauch von Bildern. Im Zusammenspiel mit neuen Technologien von KI und Automatisierung hin zu Überwachungs- und Vermessungssystemen bilden Bilder nicht mehr nur ab, sondern sind zunehmend auch „operational“: Sie messen, berechnen, verarbeiten Daten und bestimmen über Körper, Räume und Wissensproduktion.*

*In his fundamental contribution to the current discussion on visual culture, *Operational Images: From the Visual to the Invisual*, Finnish media theorist Jussi Parikka examines the changes in the understanding and use of images. In tandem with new technologies from AI and automation to monitoring*

*and surveillance systems, images no longer merely depict, but increasingly also “operate”: they measure, calculate, process data and govern bodies, spaces and knowledge production.*



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Over the past two decades, visual culture has fundamentally transformed. Images are no longer just representational artifacts

for human perception; they now operate within systems of automation, surveillance, and control. Filmmaker and theorist Harun Farocki identified this shift, coining the term “operational images”—images that do not merely depict but act, shaping environments and decisions beyond human perception. *Operational Images: From the Visual to the Invisual* by Jussi Parikka expands on this legacy, offering a critical exploration of how images have transitioned from visual objects to invisual data processes. While engaging with Farocki’s ideas, Parikka broadens the scope, situating operational images within global technological infrastructures. Moving beyond military applications, he explores their role in social, political, and economic mobilization. As he observes, “we might not (always) be at war, but we are (always) mobilized and operationalized”.

Jussi Parikka, media theorist known for his work on media archaeology, digital culture, and technological infrastructures, has previously examined the environmental, biological, and historical dimensions of media in books such as *Digital Contagions* (2007), *Insect Media* (2010), and *A Geology of Media* (2015). In *Operational Images*, he extends these concerns to contemporary image cultures, investigating how the logic of operation—rather than representation—now defines how images function in the digital age. Positioned as a theoretical manual, *Operational Images* challenges readers to rethink the role of images today, urging scholars, artists, and practitioners to critically engage with shifting visual paradigms. By expanding the concept beyond digital media,

Parikka opens new pathways for interdisciplinary research, making his book essential for those interested in media archaeology, technological development, and the future of visual culture.

In the first chapter, “Operations of Operations”, Jussi Parikka establishes the theoretical foundations of operational images, showing how they define media systems, logistical infrastructures, and epistemological frameworks. Central to his discussion is the term “operation” in recent theoretical discourse, particularly in relation to operative ontologies, capitalism, and data structures like grids.

Tracing operationalism’s roots in physics, Parikka examines how technical objects function as epistemic tools. Engaging with cultural techniques and STS, he draws on Bernhard Siegert’s work to show how operational frameworks mediate reality. This perspective aligns with Karen Barad’s agential realism, positioning operational images within broader onto-epistemological debates. Parikka uses “operation” and “operative” as methodological pivots, linking material practices to epistemological force. He argues that operational images act as logistical apparatuses—measuring, guiding, and analyzing—while reformatting territories and bodies. More than representational tools, they generate material effects across multiple scales, from abstract epistemic structures to concrete interventions like remote sensing of extraction sites.

The second chapter, “What Is Not an Image? On AI, Data, and Invisuality”, examines how technical images operate within regimes of invisibility, particularly in artificial intelligence. Parikka identifies

three key sites where image operations structure the politics of data: the platform, the dataset, and the model. Engaging with the work of Trevor Paglen and Hito Steyerl, he analyzes how digital culture displaces images from representational forms to nonhuman, operational forces embedded in computational infrastructures.

A central concept is invisuality, developed from Adrian Mackenzie and Anna Munster, which designates images that function primarily as aggregated data rather than visual representations. AI-driven machine vision technologies transform images into training models, severing them from aesthetic or communicative functions. Wendy Chun's work on computational vision informs this analysis, demonstrating how machine learning restructures the classification, processing, and execution of images.

This chapter delineates how operational images map regimes of invisibility and invisuality, offering a framework for understanding images as computational entities embedded in platforms, datasets, and models—sites where power and agency are systematically negotiated.

The third chapter, "The Measurement-Image: From Photogrammetry to Planetary Surface", examines the role of measurement in imaging practices. Parikka analyzes how measurement-images function at territorial and planetary scales, synthesizing geographical spaces through technical visualizations. Prioritizing mathematical precision over pictorial representation, these images serve as instruments of observation, calculation, and con-

trol. From early photographic plates to AI-enhanced geospatial analysis, Parikka situates photogrammetry and remote sensing within the broader history of vision and computation. In this shift, images lose aesthetic function, becoming primarily operational—whether in urban planning, environmental monitoring, or military surveillance.

Parikka also explores how operational images adapt across scales, from localized territories to planetary computation. This adaptability is crucial in climate data analysis, where images function as predictive tools for environmental change. Linking these practices to debates in planetary computation, he demonstrates how operational aesthetics shape scientific and logistical knowledge. Here, measurement-images do not merely represent space but actively structure it, reinforcing the operational logic that underpins contemporary visual culture.

The fourth chapter, “Operational Aesthetic: Cinema for Territorial Management”, delves into the concept of operational aesthetics, examining how these images shape perception and governance. Parikka argues that they often function as representations of other images, framing and narrating shifts in imaging practices rather than directly participating in operational processes. These second-order images depict institutional, technical, geopolitical, and material conditions, reflecting how operational infrastructures are mediated and made visible.

Situating operational aesthetics within cultural techniques, Parikka highlights their role in standardizing, training, and organizing

knowledge production. He identifies two dimensions of the operational aesthetic: the first, “this is how,” refers to images that demonstrate operational procedures; the second, “how that works,” concerns advanced imaging systems in military, scientific, and automated infrastructures, often exhibiting nonhuman agency.

To prove his point on the operational aesthetic, Parikka provides an analysis of the role of artistic and cinematic interventions in critically engaging with operational infrastructures. By looking into Hito Steyerl’s and Geocinema’s approaches, he shows how artists challenge, visualize, and reframe the aesthetics of operational systems. These interventions not only expose the hidden mechanisms of data governance but also offer alternative ways of perceiving operational images.

The fifth chapter, “The Post-lenticular City: Light into Data”, looks into invisibility in urban sensing, focusing on how technologies like lidar, which uses light-based scanning to create high-resolution spatial models, transform the perception, modeling, and governance of cities. Parikka argues that operational images in urban environments are not mere representations but integral to spatial data modeling, linking image production to the technological and political mechanisms shaping urban life.

Here, Parikka explores lidar technology and how this machine sensing reshapes urban environments, turning physical spaces into computationally legible terrains. Drawing on Christian Ulrik Andersen’s work on urban interfaces, he places lidar within the broader history of machine vision, highlighting its role in automat-

ing urban perception and integrating cities into data-driven governance. Also, Parikka investigates the role of invisible data in smart cities, where sensor networks, QR codes, and augmented reality act as mechanisms of control and surveillance. Referencing Katherine Hayles' theories on posthuman perception, he argues these infrastructures produce a form of urban vision that is machine-readable, making human sight secondary to computational sensing. This shift, he suggests, reconfigures urban space into a network of operational images beyond direct human observation.

This chapter reinforces that contemporary imaging technologies do not merely capture reality but actively participate in its production. Through lidar, smart city infrastructures, and platform-based governance, light itself becomes an operational force—modeling, measuring, and mediating urban space in ways detached from traditional visual representation.

In *Operational Images*, Jussi Parikka critically intervenes in contemporary visual culture, showing how images have shifted from representational artifacts to invisible data structures within computational infrastructures. His analysis reframes images from objects of perception to operations—mechanisms that regulate, calculate, and govern bodies, spaces, and knowledge systems. By positioning operational images at the intersection of media archaeology, science and technology studies, and digital platforms, Parikka provides a framework for understanding the deep entanglement of contemporary visual culture with AI, machine vision, and platform capitalism.



While *Operational Images* offers a rigorous theoretical foundation, it has limitations. Its primary focus on Euro-American media infrastructures leaves open questions about how operational images function in non-Western contexts, where technological, economic, and political conditions may produce alternative regimes of invisibility. Additionally, while Parikka identifies how operational images shape control systems, a deeper discussion of agency and ethical implications – particularly regarding resistance strategies – would strengthen the argument.

Despite these critiques, *Operational Images* remains essential for scholars and practitioners in technology history, media archaeology, and contemporary visual culture. Parikka’s expansion of operational images urges readers to reconsider how images operate within and through digital infrastructures. In his conclusion, he calls for further interdisciplinary inquiry into the role of operational images in shaping knowledge, power, and perception, an invitation that will inspire future research in media theory, computational aesthetics, and critical platform studies.