Introduction

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The interdisciplinary perspective of a sovereign image science gets more and more influenced by the rise and power of digital images, and additionally by the circumstance, that digital images are very often moving, moved, arithmetic, interactive or simulative images. The Yearbook of Moving Image Studies (YoMIS) wants to provide an international forum for the complex range of images, media technology, reception and visual culture.

The fourth issue of the double-blind peer-reviewed Yearbook *Image Evolution: Technological Transformations of Visual Media Culture* explores the recent debates in the context of image advancement in the range of technology, image structure and reception.

The editors would like to understand the history of images as a history of technology and mediality, because material transformations have always had a great impact on form, structure or content of mediatized and often multimodal visual representations. It took many years from the origin of images in the caves of our prehistoric ancestors to the interactive, arithmetic and highly immersive images of the digital age. This development always seemed to be deeply rooted in the potentials of media technologies and the numerous human inventions in the range of traditional craftsmanship, engineering science, computer science, and art and design. This perspective is the beginning of a media theory, whether if it starts with leading thinkers like Walter Benjamin or Marshall McLuhan (cf. Benjamin 1991 and McLuhan 1964).

Nowadays, these academic discourses surely work with more profound and more detailed analytical tools, concepts and methodologies. But also, a modern media theory that analyzes, describes, and characterizes technological transformations surely receives new insights. The factual embedding of images in the historical-technological processes

constitutes a complex structure of an autonomous Image Evolution that must be highlighted, characterized and analyzed by the interdisciplinary academic discourses that are related to the functions and structures of visuality, pictoriality and the manifold technological forms of multi-sensoric representations. The chosen term Evolution is deliberately indicating structural laws that underlie historical events. These laws are not teleological or ontological driven, but more intentional and structur logical processes of an historical and technological interdependency. Such models of structural logic are set apart explicit from teleological and ontological models in Hegelian tradition in order to explain them instead from their immanent structures as well as their interplay with the most distinctive other developments. In this interdependency, the technology is not only evolving out of its inherent structures and at the same time embedded in anthropological conditions and sociocultural dynamics. This process of evolution is also intervowen with different cultural practices, which are scientifically addressed by media use studies, and innovation management, which concentrates on the economical bases for change in media stuctures and societies. These aspects taken together showing the complexity of image evolution and its impact on human beings, perception, cognition, society and culture. However, media studies are focusing on the perspective on the specific relevance of the media without, however, deriving a monocausal model from it (Kirchmann 1998).

In this context, the editors are explicitly arguing for the conceptual strategy working with the concept of an Image Evolution. They would like to understand images as visual, and further multi-sensoric, artifacts that are historically and technologically embedded within the developments and relations of materiality, mediality and reception. Beside the integration of this different aspects the issue is also expanding the time frame of the research topic: The development of mediality is not only a project for media historiographies in the context of a media archaeology, but also connected with the logic of recent developments in the context of prototypes, future ideas and innovations.

The interdisciplinary topics of the authors are addressing different aspects of the materiality and technology of images and visual media, sometimes with the focus of a specific academic approach on the history and logic of image evolution and media developments, and in other cases

referring on material and technological effects of the reception of dynamic representations. Image Evolution is a perspective and a structural component of images; therefore, some explorations are referring to the multimodality and multisensoriality of static, moving and digital images, which often goes beyond pure visuality, and some considerations were formulated with regard to the context of the historical, cultural, aesthetic, philosophical and transformational impact of existing image media and future innovations.

In a phenomenological driven viewpoint Fabrizia Bandi is highlighting in *The Aesthetics of Virtual Art: A Phenomenological Approach* the relation of virtual art with the human experience. This relation is described as an immersive space that relates the artistic creation, the aesthetic object and the recipient. The author focusses on the concepts of reality and unreality in the range of the imaginary and the possible with regard to Dufrenne, Sartre and Deleuze and argues for three comnponents of virtual art as immersive, technological and coinciding with human space and time.

Christiane Wagner is relating in *Art and Perfect Illusion: From Architecture to Cinema in the Era of Technological Convergence* the aesthetic and image theoretical dynamic of technological convergence. Images are described in an aesthetic and historical perspective as specific artistic ideas and architectural achievements in relation to the moving image. The author focusses on thinkers like Benjamin, Brecht, Deleuze, Baudrillard, Adorno, Hegel and Kant to evaluate the processual dynamic of image creation and to explore elements like imagination, illusion, reasoning and aesthetic judgement.

In *The Rise of Things is the End of Images: A Picture is Worth a Thousand Hands* Andreas Schelske describes the specific transformation of the image function from communication to production. The author addresses the development of image machines in the era of postmodernity and asks semiotically – with reference to Peirce –, what iconic function the object reference have in virtual reality and computer-aided design and how it can be justified that VR development proclaims the partial end of visual communication. The author argues that image machines are semantizing machines and image use is changing once again in media history.

Lars C. Grabbe argues in *Image Transformation: The Hyperaisthesis of Digital Images* that multimodal image media technologies are enhancing the processes of sensory media perception. The author is highlighting hapto-tactile media in the context of images and proclaims that a progressive image science has to develop analytical concepts for a deeper understanding of potentials and possible side effects of these multisensory images. This article develops image-theoretical concepts for the characterization of hyperaesthetic images, which means, that images as elements of interactive and hapto-tactile media technologies are more than clearly distinguishable two-dimensional picture surfaces and turn into multisensory images.

With *Orientation and Cartographic Imagination in the Age of the Digital Earth: Notes Toward an Aesthetics of Google Earth* Tommaso Morawski presents the specific epistemological transformations that are caused by diffusion of geo-media and their digital cartographic systems. The author retraces the cartographic genealogy of Digital Earth and outlines how the medialization of a Whole-Earth is connected with cartographic imagination. The author explains that maps function as specific media in which mythical geographies are incarnated and as a source of a history of cultural representation that encodes subjects.

Dario Cecchi is focusing on premediation in *Cinegrams of Premediation: Harun Farocki's Videograms of a Revolution and the Future of Cinema*. In orientation to Grusin the author is writing about dominant media processes as forms of a radical mediation and refers the argumentation to Harun Farocki's latest experimental documentary movies, as an example of political aesthetics. Furthermore, the author is highlighting the postmodern condition of the human spectator by referring to Lyotard and Flusser and underlines that there is still room for practicing imagination and theorizing its new manifestations by images.

With a specific view on spectatorship and reception Giorgos Dimitriadis is characterizing in *An Economical Model for Theorizing the Perception of Visual Narrative in Digital Cinema* the cinematic worldmaking. The author works with theoretical concepts of Hochberg and Brooks to give insights in the way how an active viewer's reception handles narratives taking place in movie universes potentially unseen before. The author underlines the use of narrative notation models with regard to the selective nature of perceptual capacities and argues that the depending

use of narrative breakpoints and event segmentation can support the comprehension of narrative moviemaking.

In *From Images of Lines to Images of Particles: The Role of the Film Camera in Flow Visualization* Mario Schulze and Sarine Waltenspül are focusing on scientific film and try to give insights into an unexplored research field. The authors examine the situation when film was implemented in the field of fluid dynamics while photos were standard method to visualize flows and they give an answer to the question of how the image evolution of scientific photos to film proceeded. Focussing on the first experiments by Ludwig Prandtl at Göttingen Institute the authors show that photos as well as films always occupied a precarious position between qualitative imaging and quantitative measurement.

The different and interdisciplinary approaches that are connected in the volume *Image Evolution* try to focus explicitly on the relation of visuality, technology and culture to locate and present specific findings and further problem areas that should be clarified in the future of analog and digital technologies, old and new media and specific prototypes. Media technology and its structural influence on media materiality has a specific role to play in the context of the dynamic development of old and new image concepts: The more a media technology is becoming a trigger for new forms of image materiality the cultural and historic experiences with these images are changing too. Image Evolution could be one structural component of the image discourse to connect the concepts of static and dynamic images with the approaches in modern media theory, history, design and art theory, aesthetics, and film studies as well as the complex range of image science.

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