# Introduction: Film Heritage and Digital Scholarship – Computer-Based Approaches to Film Archiving, Restoration and Philology

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Today, as a growing number of (inter)national film archivists and curators are being formed in our programs, the next generation, it seems, will be well equipped to bridge theory with practice and the analog past with the hybrid and digital present. As heritage is now receiving renewed attention by policy makers, partly due to the new possibilities offered by digital access, it is imperative that a well-informed discussion continues to take place between scholars and archivists so that we can promote sustainable policies for our field at large.

*(Giovanna Fossati)*

## 1    Moving Image Archiving Re-Born Digital?

In contemporary theory, a recent tendency has taken off discussing the relationship between Film Studies and media structures as new convergences of digital culture. In fact, in the last years, film and media studies have witnessed an emerging interest in integrating computer-based techniques for analyzing and visualizing both quantitative and qualitative data relating to film. This emerging interest can be seen in the development of approaches that involve new and practice-based audiovisual methods, such as videographic criticism and video annotation, as well as various data visualization and digital humanities techniques that rely on empirical methods such as data mining, linked data, geo-tagging and mapping, in order to study, among others, filmic structure, style, discourse, storytelling and reception (Grant, 2012; Ingravalle, Prelinger & Latsis 2015; Ferguson, 2016; Verhoeven, 2016). This development has opened new territories for film history scholarship and its traditional focus on the cultural significance of films in terms of aesthetics and medium specificity, while also leading scholars to explore and reflect on potential new paths for interdisciplinary research methods (Grant, 2012; Acland & Hoyt, 2016). Many projects that are being currently carried out use digital means to study digitized film archival content, relying on fruitful cooperations between multiple disciplines. Through new tools and collaboration with scholars from disciplines that were traditionally distant from film and media studies — such as data, computer and information science, and practice-based research — the relation between researchers and their sources, films and related materials, is being reconfigured.

There is for sure the optimistic narrative that with the aid of technology we can decipher audiovisual text in a different way or structure and compare datasets in ways which were not possible before. In short, we might be aiming for a different kind of knowledge about our field by using different tools and approaches. Where and when did thoughts on how to re-organise knowledge production and dissemination begin? Arguably, the beginnings of a possible restructuring of knowledge and the academic world per se (in the US) can be dated to 2003, when the National Science Foundation (NSF) commissioned a report, later named after then chairman (Dan Atkins 2003). Some years later, probably more directly aimed at revolutionising the humanities and neighboring fields, Schnapp and Presner asked for a reevaluation of the relation between scholars and GLAM professionals — i.e. the acronym for galleries, libraries, archives, museums — in their "Digital Humanities Manifesto 2.0" in 2009, and "affirm that modern universities still tend to separate scholarship from curation, a fact that is hardly deniable" (Heftberger, 2014]. Nowadays the "curation of data", e.g. data management, data wrangling, data mapping and data sharing have become core elements of the daily work in archives, libraries or museums. It is useful to consider the people working in GLAM institutions and their professional background, which is far from uniform. However, library, archive and IT staff as well as other para-academic non-faculty staff have been performing what would be considered by some "digital humanities work" [...] [which]is conceptualized according to one of the other models: hourly, by full-time equivalent, or as an agenda of projects that granularizes and regulates the work in quantifiable ways" (Flanders, 2012).

GLAM-Institutions can usually identify relatively clearly which tasks are suitable to be supported by software. Typically, subject indexing and visualizing collections online are named by professionals. In addition to these continuous duties, exciting sub-projects are being developed that are worked on in collaboration with scholars and artists, and which would offer tremendous added value for everyone involved. People working in film collecting institutions can assist with analog and digital technical knowledge, as well as a comprehensive knowledge of film titles in their holdings and how to structure metadata surrounding the analog and digital objects. Thus, they can contribute to broadening a so far arguably narrow view on film history which too many times only focuses on iconic titles and male directors. Looking into cast and credit roles and how they

changed over the course of time in different languages may definitely change our perspective, for example when it comes to the involvement of female filmworkers (Pearlman & Heftberger, 2018).

This development creates new expectations and challenges for film heritage institutions as well, specifically with regard to the role that they may play in relation to digital scholarship in creating and offering access to archival collections and data. As still larger digitization projects have continued to emerge in recent years, within a political climate that promotes and stimulates digitization and development of digital research infrastructure for studying collections, film heritage institutions need to develop sustainable and critical models for facilitating, shaping and benefiting from digital scholarship in film and media studies, all the while being mindful of their own institutional core values and missions.

In an article published in *Frames Cinema Journal* almost ten years ago — and which is worth citing at length to capture the ambition of this volume — film and media scholar Catherine Grant highlighted that to make sense of these developments requires "a commitment to theoretical and methodological pluralism, and genuine interdisciplinarity", implying that "the methods and assumptions of natural science and information science rub digital shoulders with those of creative critical practice and interpretative work", and "that film and moving image studies publications ought to be capacious and confident enough to create conversations between discourses and methods that are often kept apart politically and intellectually" (Grant, 2012). Taking the cue from this suggestion, we wanted this special issue to offer a platform for thinking through productive connections, synergies and frictions between emerging methods in film and media studies and the current work of film heritage institutions. In doing so, we encouraged contributors to stage speculative encounters between approaches and practices as well as to discuss concrete case studies, so as to imagine future paths. Of course, our purpose was not to try to offer an all-inclusive nor comprehensive survey of state-of-the-art results. Nor did we have the ambition to develop standardized principles and guidelines or best practices in the field, but to contribute further to a conversation informed by theoretical and methodological pluralism within an interdisciplinary field, that has developed in the past approximately ten years in, among others, the publications cited above.

## 2   The Paths of Proposals: Philology, Infrastructures, Creative Practice

Looking to accommodate for a broad range of approaches and contributions pertaining to a wide variety of practices, the contributions included in this issue roughly fall into three strands, with some of the contributions belonging to multiple strands. Respectively, these strands are what we may label (1) a videographic-philological strand, (2) an infrastructural strand, and (3) a practice-based creative strand.

### 2.1   Videographic Film Philology and the "Post-Digital Critical Film Edition"

The first strand sees our contributing authors reflect on the opportunities for digital techniques of scanning, visualization and videographic approaches as a part of film philological restoration work, involving analyzing and comparing film prints as film 'texts' with unique material histories embedded in them. Focussing on the case of Ferdinand Zecca's *The Life and Passion of Christ* (*La Vie et la Passion de Jésus Christ*, 1907), Olivia Kristina Stutz' article "Comparative Colour Film Style Analysis and the Identification of Archival Film by Computational Means" considers the prospects of advancing film philology using computational approaches. Reflecting on her work with the custom-built annotation and visualization software VIAN, Stutz argues that a mix of quantitative and qualitative computational approaches may offer a yet-to-be explored powerful means of carrying out and complementing traditional film identification work and philological analysis, working both from archival scans and DVD rips. Written against the backdrop of the coronavirus outbreak and the experience of having to adapt to remote working, Andrea Mariani and Serena Bellotti's article "The Digital Witness. Film Reconstruction and the Forensic Imagination in New Media Environments" considers the feasibility and conceptual implications of working from digital edge-to-edge scans remotely in the restoration process. As "an experiment in phylogenetic and philology in a digital environment" the article offers insights into setting up and organizing such a collaboration while also offering preliminary insights and experiences that may offer a path for future projects. Bridging the issue's first and second strand, Simone Venturini's "From Edge to Edge. The Restoration of *La battaglia dall'Astico al Piave* (1918) and the Search for a Digital Historical-Critical In-

frastructure", considers the affordances of emergent scanning techniques that allow for studying edge-to-edge scans as historical source material in film philological work. Tracing and situating his work in relation to the practice of digital critical editions of archival film that flourished in the 2000s, Venturini calls for the conceptualization of a "post-digital critical film edition" that instead of chasing an ideal of wanting to return textual elements to a complete version, emphasizes collaborative interpretation and acknowledges multiple configurations of restored film elements.

## 2.2 Infrastructures and AI

In the special issue's second strand our authors explore and reflect on novel software approaches developed in the context of larger infrastructure projects and moving image repositories, as well as on the building of infrastructure for specific, digitised collections and for the exchange of film research data. Echoing and expanding Venturini's plea for yet to be developed infrastructures for film restoration work and speaking to Stutz' call for sharing film identification data in the issue's first strand, Alice Plutino et al.s "FiRe[2]: a Call for a Film Repository of Technical Data and Memories for Photo and Movie Restoration" reflects on the development of a shared database of film technical data with reliable, professional information, specifically with regard to sensitometry and densitometry data as well as colour reproduction. Analysing the Fire[2] database in relation to a broad array of European digital film heritage databases, Plutino et al. suggest a model for an open-source database through which such data may be efficiently shared in a more systematic manner. Extending the discussion of open-source software's applications for sharing and enriching digital film heritage, Nicolas Dusi et al.s "A Website for Cesare Zavattini's Works. Digitizing and Dynamizing a Personal Audiovisual Archive" analyzes the affordances of the IIIF-framework for collaboratively annotating and engaging in a playful manner with the archives of screenwriter and key thinker of the Neorealist movement Cesare Zavattini. Based on a comparison with web-based projects focussing on film-related sources — such as the Archivio Michelangelo Antonioni and the Cineteca di Bologna's Charlie Chaplin Archive — the article offers fascinating insights into the current digitization of the Zavattini archive's holdings and the becoming of the website and its user-centered design aiming at fostering "collaborative individualism". The final contribution to this strand, Beatriz Tadeo Fuica et al.s "Watching historical films through AI: reflections on image retrieval from heritage collections", combines a televisual approach with textual and contextual film historical research to discuss the potential of the Snoop software, developed by the French National Audiovisual Institute (INA) and the National Institute for Research in Digital Science and Technology (INRIA), for analyzing and developing a "distant viewing" (Arnold & Tilton, 2019) perspective on classic films from the years 1902-1952 broadcast on French television. As a means to facilitate the exploration of patterns in the televisual repertory of French film broadcasting — available in the INA collections — the authors pushed the boundaries of the Snoop software, by combining analysis of traditional, semantic visual concepts with, among others, Nicole Vedrès' groundbreaking visual typology of French cinema developed in her key work *Images du cinéma français* (Les éditions du chêne, 1945).

## 2.3 Practice-Based Approaches and Creative, Deformative Interventions

In the issue's final strand, we have grouped together two contributions that consider the relations between experimental, deformative data visualization work with artistic, practice-based approaches. To cite media scholar Kevin L. Ferguson — to whose work these contributions may be considered congruent to different degrees — the articles in this strand present work that "balances between [...] new media art and digital humanities scholarship" (Ferguson, 2016). Diego Mantoan's "A Digital Picklock for Video Art Exegesis. Reflections, conditions and possible employment of distant viewing to moving image datasets in visual arts scholarship" offers an in-depth reflection on Lauren Tilton and Taylor Arnold's "Distant Viewing" framework for the study of iconography and style in video art. Underlying Mantoan's reflection on quantitative approaches is the argument that media art scholars should take inspiration from video art's experimentation with technology to explore new means of aesthetic expression — "deforming aspect patterns, altering the colour palette, overlapping different frames" — as a means to potentially rethink video art scholarship. Focussing in part on similar image features, Patricia Ledesma Villon takes an outspokenly deformative stance in her *Indeterminable Frames* project, that forges connections between recent digital humanities scholarship and Gene Youngblood's classic *Expanded Cinema* (1970). Analyzing classic experimental works from the period of expanded cinema, Villon conceptualizes film data visualization and pattern recognition as "act[s] of disrupting or re-organizing a work's

original order to bring to attention possibilities of meaning not seen otherwise". In doing so, she not only highlights how the richness of Youngblood's media theory may (once again) still be considered relevant and future-oriented, she also opens an avenue for future deformative approaches based on a closer dialogue with classic, experimental media theories and practices.

Therefore, this issue aims to explore film heritage studies and digital humanities in relation to multiple subjects, such as archives, artificial intelligence, databases, cinema history, film philology and restoration, data visualization and pattern recognition, and others. Both the fields of research and the methodologies involved in these essays work within larger disciplines of cultural investigation, expanded among emerging practices across media, to provide insights into the many methods, advances, problems and lessons learned during the application and development of the digital tools.

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