Abstracts - Sensory Moving Image Archives Symposium

Session 1

Lecture 1: "Film and Moving Image Studies: Re-Born Digital and Audiovisual? Some Updated Participant Observations"
Catherine Grant (Birkbeck, University of London)

Catherine Grant's opening lecture at the Sensory Moving Image Archives symposium reflects on the emergence and affordances of digital tools and technologies for film and media scholars. As a prolific and pioneering scholar in Digital Film and Media Studies and one of the foremost advocates and makers of scholarly audiovisual essays, Grant will share participant observations from the field while retracing a personal history and practice of engaging with digital tools and publication formats, illustrated with examples from her own work and research.

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"Deep-learning Tools for the Visualization of Film Corpora"
Barbara Flueckiger and Gaudenz Halter, University of Zurich

One of the bigger challenges in analyzing large corpora of films is the development of meaningful types of visualizations for large groups of films based on idiosyncratic features. During the last months the video annotation and analysis platform VIAN1 has been developed to deliver a large range of visualizations for a corpus of more than 400 films, more than 17.000 segments and more than 0.5 million summations.

Increasingly, VIAN connects different types of sources to extend and elaborate its analysis and visualization methods beyond the scope of this project and to connect a variety of sources or collections. One of those new extended tools is an online portal for VIAN projects of external users that processes and visualizes their data to provide new insights into the correlation between color features and qualitative analysis.

A second extended application is an exhibition for historical film colors that will take place at the Fotomuseum Winterthur. This app aims at engaging users in a playful approach to the topic of the exhibition and to connect the items on display in the museum with information presented on the Timeline of Historical Film Colors.

Collections of screenshots are analyzed colorimetrically for whole image representations, background / foreground segmentation or distributed color schemes in the CIE L*a*b* space, saturation over time, color scheme development over time, texture and pattern plus visual complexity over time, a features tool to display analytical concepts over time and their correlations. All of these sets of methods are integrated into the corpus visualizer that enables users to compare films based on each of the analytical concepts defined in a thesaurus or filmographic information.

By this integrated and carefully reflected method, instant patterns emerge that provide a plenoptic overview of the film corpora, stills, and exhibits in a three-dimensional color space or in depictions of temporal distribution on micro (temporal segment), meso (film) or macro (corpus) level. Our talk will provide insights into the various requirements, databases, processing pipelines and visualization methods.

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"Sensory Features for Archive Exploration"
Marcel Worring (University of Amsterdam) & Nanne van Noord (University of Amsterdam)

The goal of exploring an archive is to learn about what is inside the archive and how it is structured. Due to the (ever increasing) size of moving image archives it is no longer feasible to explore the archive by viewing all the material. Therefore, to enable exploration of moving image archives we need tools which express and make visual the diversity of the archive. A key component of such tools is the manner in which the data is represented.

While traditional tools often operate based on a data representation which is driven by metadata or semantic visual content we aim to describe the moving image material in the archive based on sensory features. An additional difference with traditional tools is, that the features we use are not the byproduct of some other analysis but are intended to be use for data visualisations. As such there is an increased demand for interpretability and explainability, to maximise the understanding and agency of the user.

In this work we describe the process of developing sensory feature descriptors which capture colour, shape, and motion aspects of moving image material in accordance to the aforementioned criteria. In addition to the (technical) description of the feature development we will also show a number of patterns and structures which have become exploreable and discoverable due to the usage of sensory features.

Demo Session Presentation 1

Prototyping for the SEMIA project
Maaike van Cruchten (Amsterdam University of Applied Sciences), Frank Kloos (Amsterdam University of Applied Sciences) & Harry van Vliet (Amsterdam University of Applied Sciences)

Maaike Van Cruchten and Frank Kloos have been working in the SEMIA project since February 2018 with interaction design and prototyping for the project. In this presentation they will discuss some of the underlying principles of their design process while presenting results so far.

Session 2

Lecture 2: "Selecting and editing a BBC Programme Using Machine Learning and AI"
George Wright (BBC Research & Development)

BBC R&D used artificial intelligence (AI) to create a network broadcast TV programme. We ingested 270,000 hours of video to build a model of the channel, and then auto selected video clips which would surprise and delight, and then used AI to edit the clips into a finished show. Our approach was novel and surprisingly watchable.

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"Detecting Duplicates of Moving Image Representations"
Kryštof Pešek (Digital Laboratory of Národní filmový archiv, Prague)

The mission of Národní filmový archiv is to collect, preserve and promote cinema heritage and to facilitate the development of the Czech audio-visual industry and film culture. Currently, the NFA takes care of more than 150 million metres of film, more than 500,000 photos, over 30,000 posters, and 100,000 promotional materials. Archival collections and a film library serve professionals engaged in scientific research and are a source of information and materials for contemporary audio-visual production. In the years 1965-2008 the NFA preserved nearly 24 million metres of film copied from highly flammable stock.

In 2013, NFA began to systematically digitize it's film collections in large quantities by establishing a new department called Digital Laboratory. This unit also takes care of long-term survivability of the digital, including contemporary born-digital acquisitions coming from legal deposit of cinematographic works.

In order to distinguish between various representations of certain titles, we develop custom software. It combines reusing of our quality-check mechanisms (QCTools [1]), based on averaging raw pixel color values and custom shot-length detection mechanisms (currently built using Processing software[2]). Combination of such data can give us unique understanding of each video file. These statistic mid-products can help us in spotting possible duplicates more easily than analyzing full original data. Although our goal is to select matching sequences across the digitized material for further inspection by curators, an interesting side-product is rich statistics which give us different view of our moving image collection.

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"Deep Learning as a Tool for Early Cinema Analysis: Experiences with Detecting Intertitles in Silent Film"

Wegter, Rob (University of Amsterdam), Samarth Bhargav (University of Amsterdam), Nanne van Noord (University of Amsterdam), Julia Noordegraaf (University of Amsterdam), and Jaap Kamps (University of Amsterdam)

Automatic annotation techniques have shown promising results in a wide variety of moving-image analysis tasks on modern material. In this project, we explore the possibilities of applying a data-driven approach to problems and questions concerning early cinema by using techniques based on Deep Learning. As a test case we attempt to detect intertitles in early cinema. Intertitles have not been studied extensively, but they provide a way of looking at

different aspects of early cinema, like narrative, distribution history, and aesthetic qualities of early cinema. Instead of looking at films separately, we explore the possibilities of deep learning to zoom out and find the intertiles in a big corpus.

We make two key contributions. First, we obtain a frame-level classifier by training on a small sample of hand-annotated frames and achieve high accuracy. We evaluate this model by running automatic intertitle detection on a gold standard collection of 25 movies from the Desmet collection, hand-annotated by an expert. We show that this model performs much better than a color histogram baseline. Second, we run our model on the entire Desmet collection and attempt to analyze the data by looking for visual differences in the shots before and after intertitles. In addition, we demonstrate the utility of the system by making the output available in standard formats, such as the ELAN format.

Session 3

Lecture 3: "Artistic Visual Analysis of Large Image Sets"
Geert Mul (Media Artist)

The work of media artist Geert Mul is a key source of inspiration for the Sensory Moving Image Archive project's approach to visual analysis of archival collections. Preceding and intertwining with scholarly practices of analysis and visualization of large image sets, Mul will discuss how he develops computational approaches to image analysis in his artistic practice, while reflecting on the poetic forms of exploration these approaches enable.

Session 4

Lecture 4: "Sensory Information Seeking in Digital Collections"
Mitchell Whitelaw (Australian National University), remote participation via Skype

How might we make digital collections available as rich sensible interfaces that build on the audio/visual qualities of their contents? Building on the concept of generous interfaces, and drawing on examples spanning cultural heritage and environmental data, I offer some practical

approaches and conceptual tools for what might be called (after Ben Shneiderman) "sensory information seeking" in digital collections.

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"Projecting film archives - Lessons learned from the visualization of cultural heritage collection data"
Mayr, Eva (University of Krems, danubeVISlab), Adelheid Heftberger (German Federal Archive), Florian Windhager (Danube University Krems) & Marian Dörk (Institute for Urban Futures, University of Applied Sciences Potsdam)

Information visualizations promise an inviting way of access to cultural collections for non-expert users by providing overviews of temporal, geographical, material, relational, or categorial patterns in a collection and different detail perspectives on the individual artifacts. Drawing from experiences in recent and ongoing research projects (VIKUS https://uclab.fh-potsdam.de/vikus, PolyCube http://donau-uni.ac.at/en/polycube) and a comprehensive review of cultural collection visualizations (Windhager et al., 2018) we discuss challenges for the visualization of time-based media as in digitized film collections: 1) Visitors of cultural collections want to do both: experience exhibits akin to a stroll through a physical exhibition and contemplate objects of interest in depth (close and distant viewing). How can we integrate familiar and novel viewing modes for film collections? 2) Cultural collections are rich in information and have a complex metadata structure assigned to their primary objects, such as geographical, temporal or categorial information. How can we support users' understanding of such data dimensions for film collections by designing multidimensional visualizations? 3) The significance of cultural objects stems from the appeal of their primary objects, but also from their relations to historical events, actors, or other objects. How can we enrich film collection visualizations with such contextual information? 4) Arts and cultural mediation also often require a comparative and critical approach to collected objects and artifacts (Glinka et al., 2015; Heftberger, 2018). How can we support these operating procedures with interface design strategies?

While cultural collection visualization has steadily grown in recent years, relatively little work tackled audiovisual collections, which also results from the more complex characteristics of time-based media, e.g. their specific metadata structure and their multimodal, narrative nature.

To explore related concepts and challenges, we will present visualizations from the literature and our own work, discuss implications for film archives, and speculate about possible directions for transdisciplinary research on the visualization of film collections.

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"Looking Beyond the Picture - Enhancing Sensemaking of Audiovisual Materials in the Media Suite"

Hugo Huurdeman, Liliana Melgar Estrada, Jasmijn van Gorp, Julia Noordegraaf, Roeland Ordelman

Moving images have been called a "blind medium" (Sandom & Enser, 2001), due to their temporal and audiovisual nature. Often, manual sequential viewing and annotation is necessary to transcode their contents or identify meaningful objects (Melgar Estrada & Koolen, 2018). This poses problems for providing meaningful access to the multitude of media items in large audiovisual archives.

The ReVI project focuses on the Resource Viewer of the Media Suite , a Virtual Research Environment 1 (VRE) created as part of the Dutch Humanities infrastructure project CLARIAH. The Media Suite 2 provides access to the rich collections of various large heritage institutions in the Netherlands (Ordelman et al., 2018a, 2018b). The existing Resource Viewer allows for viewing and annotating actual media items within the Media Suite. The aim of the ReVI project, a pilot project within CLARIAH, is to enhance the user experience in the Resource Viewer. In the context of scholarly research, this includes improving research process support (Bron et al, 2016; Melgar Estrada et al, 2017). To this end, the project rethinks and rearranges available functionality, and investigates how to better facilitate "distant" visual exploration of the contents of individual media items, as well as closer analysis.

Our proposal sheds light on the design process of the enhanced Resource Viewer, and provides insights into conducted prototyping and user testing phases, following the Usability Engineering Lifecycle approach (Mayhew, 1999) and incorporating Design Thinking methods. Specific outcomes include temporal tag clouds, which facilitate sensemaking of audiovisual items in the Media Suite's collections, based on available metadata and enrichments such as Automatic Speech Recognition (ASR). We show the importance of transparency for these tag clouds, but also how they potentially facilitate looking beyond the picture and into the temporal

aspects of audiovisual content. As such, they demonstrate the heuristic value of the enhanced Resource Viewer for 'scalable' humanities research, navigating between distant and close reading of audiovisual sources for media scholarship (Denbo and Fraistat 2011; Moretti 2013; van der Molen, 2017).

Demo Session Presentation 2

"The Movie Mirror"
Studio Louter

The interactive installation *The Movie Mirror* by Studio Louter deploys a machine learning system matching the user's camera images with historical footage from over sixty films from the collection of Eye Filmmuseum, from classics and animations to short experimental films. By striking different poses, users play with the compositions of films and may be surprised by the cinematographic reflections they encounter. In this presentation we will give insights into the process of developing the installation and reflect on its results so far.

Session 5

Lecture 5: "Approaches to and Experiences with Searching and Reusing Moving Image Archives"
Mirka Duijn, Media Artist and Documentary Filmmaker

In her lecture, Mirka Duijn will offer an overview of the projects that characterize her artistic practice and approach to searching and selecting archival moving images. Having worked extensively with archival moving images in her documentary work while also being involved in generative art projects, Duijn will share her insights on approaching moving image archives in ways both manual and data-driven.

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"'Invisible Archives': Tracing the use of formal archival strategies in the video, Patterns, to remember Stonewall"

Carleen Maur, University of South Carolina

How do media artists locate and work with archives that don't exist? During the production of my experimental video essay, Patterns, I was forced to reckon with the invisible archive that documented, or didn't document, moving images of the 1969 New York Stonewall Riots. The three day event that happened that June was documented by reporters and photographers for locals newspapers, however it's still unclear if moving images were ever made or, if they were, still waiting to be uncovered in an archive. Regardless, I grappled with not only the inaccessibility of LGBTQ+ resistance history, but also with what was at stake for my own project. While the Stonewall police raids were documented in other ways including still image, newspaper clippings and police reports, other key moments of LGBTQ+ resistance in the United States such as the 1966 Compton Cafeteria Riots, are documented even less. Throughout the project I found queer voices from these histories primarily in recorded oral accounts and personal narratives written and spoken by the folks who were there or who knew someone who had been there. Using my resulting video essay, Patterns, I'll trace how I switched my focus from an archive that provided real time documentation of the events surrounding LGBTQ+ resistance and instead focused on the formal elements documented from oral histories. Thinking through police lines, and Pride parade lines, I chose to focus on linear formal patterns to construct an homage to the resistance that happened at these raids.

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"If Maps: Cartographic Sketches Powered by Experimental Films"

Eric Theise (Software Developer & Artist)

"If Maps" is an ongoing series of artworks in the form of digital maps derived from the strategies employed in the making of experimental films. Created using open data and open source software, the series manifests sometimes as software libraries paired with interactive demos, sometimes as single channel digital videos. "If Maps" emerged from the insight that the software packages used for geospatial data analysis and digital map production were, conceptually, experimental animation tools, and from a desire to apply the requisite technical skills to artmaking.

Frame-by-frame color analyses can drive the cartographic palette. Repeated, mirrored, and flipped footage can suggest ways of foiling user expectations of how a map will pan, zoom or rotate. Elements of maps – popups, markers, scales, legends, cartouches – can conspire to cloud, not clarify, a map's meaning. Subtle or assaultive applications of color theory in combination with strobing or durational presentation can produce afterimages due to sensory fatigue. Two dimensional representations can suggest three, three dimensional representations can be stretched to where they break and cause discomfort.

This talk will present excerpts from the series, the films and makers that inspired them, and foster discussion about possible adaptations of SEMIA's approaches to deepen the inquiry.

Session 6

"Every Image a Database"
*Steve F. Anderson (Universi*ty of California, Los Angeles)
Drawing on his experience as a scholar-practitioner working at the intersection of media, history, technology and culture, Steve F. Anderson's lecture will respond to the papers and presentations featured at the Sensory Moving Image Archives symposium. With a background that ranges from experimental filmmaking and interactive media design to digital humanities research and technology development, Anderson will also share insights from his current research project "Every Image a Database." Building on the critical foundation established in his book *Technologies of Vision: The War Between Data and Images* (MIT 2017) and his recent work with virtual and mixed reality, this project examines tensions between human and algorithmic image processing across a range of media forms and cultural contexts. His goal is to articulate an ethically defensible model for understanding and reshaping visual culture as emerging technologies continue to train us to inhabit a world defined by the logics of data.