Bibliography

Journals, Scholarly Articles, and Periodicals:


Positions the experience of buffering among a history of noise in visual media that includes other relevant moments of digital breakdown or glitch. Compares digital imperfection to earlier forms of spectatorial noise that affected film, VHS, and DVD. Connects buffering and other audiovisual noise to neoliberalism, economic infrastructure, and modern practices of spectatorship. Author also links compression to forms of erasure, degradation, and data loss. Keywords: buffering, lossy compression, fragmentation, spectatorship


Outlines the major complications and necessary considerations of digital film preservations, including: digital storage localisation, retainment of cultural heritage, “digital rot,” film degradation, compression, format compatibility, and color preservation. It proposes IMF as the ideal format for future proofing film-archival content because it works across workflows and imposes a universal standard that would last into the future. Keywords: film to digital, format, compatibility, storage, preservation, standardization, degradation, restoration


Describes a series of works from the Electronic Visualization Laboratory in Chicago in 1978 and 1979 that the author identifies as one of the very first examples of glitch video
art. This makes it an early foray into artistic engagements with the materiality of digital media and video processing. Outlines fragmentation, repetition, and linearity as tendencies of glitch art, and analyzes the “noise” that becomes visible in instances of digital system failure. Keywords: glitch, aesthetics, experimental art, early video


Symposium takes place at a critical phase in the transition of 35mm film to digital in common practice and asks contributors questions about what this transition could mean. Much attention is given to the material and aesthetic difference between film and digital, particularly in relation to decay and deterioration. They also speak about digital restoration of celluloid film and the ability of one format to capture another. Keywords: 35mm film, digital restoration, reproductions, digitization, archives, videotape, deteriorated, degradation


Here, the author grapples with his own notions of the capability of material storage to preserve data, then connects this to the inability for even digital storage to preserve information indefinitely. The lack of precedence for management practices of digital records, mass proliferation of formats, obsolescence of websites and operating systems, and system incompatibility could lead to a “digital dark age.” Significant source for its discussions of loss of information across format transitions, a process that involves compression and necessitates compatibility. Keywords: hardware, software, obsolescence, format, archives, preservation, transcription

Describes both intentional and unintentional “disfiguring” of the image in the form of distortion and noise. This deliberate glitching not only resembles equivalent effects in analogue media, but reflects the image’s basis in binary code. Investigates the various ways that glitches manifest and their effects by unmasking, effacing, and facing the image. Valuable thoughts on the glitched image. Keywords: glitches, aesthetics, abstraction, noise, datamoshing, video art


Links horror films about the living dead to traces of mediation such as film grain, distortion, and digital pixelation. The author analyzes films that link format and resolution with bodily dismemberment and degradation. Relevant topic of the aesthetics of degraded media images. Keywords: Ontology, format, analogue, “digital dead,” nostalgia, remediation, deterioration.


Points out that contrary to the notion of historical films as “universal unchangeable forms,” these films are composed of not only content, but as a material susceptible to degradation. Focuses on format of significant cultural works as a collection of physical film elements including film negatives and positives, duplicates, tapes, and masters. These duplicates and multiple versions will differ from the original, so successive historians and film scholars will not see the film in the same way—“duplication in analogue media is lossy.” Keywords: format, deterioration and degradation, remasters, restoration, analogue media, 35mm film, quality, historical film

Author describes the adoption of digital technology in the distribution and exhibition of film and the rise of digital projection. Concerns the changes that must be made with the adoption of new technologies and new formats. Deals with the effect of format on resolution and the ability of format to resist degeneration. Also covers the possible consequences of “digital decay” as a result of digital projection technology. Keywords: format, projection, exhibition, resolution, distribution, interoperability, standardization


Explores technical and aesthetic perspectives on high-definition images. Discusses the sensory phenomenon that is sight and perception, process of inscription and recording in early video technology, and modern standards for high definition images. Details procedures and effects of compression across a history of film and video, and the resulting resolution. Keywords: Compression, resolution, high-definition, format, reproduction, aesthetics, perception, analogue video


Details the conflict arising from the reduction in the usage of 16mm prints and the decision of the Soho Film Lab to cease 16mm print production. Relevant mostly for the quote “the integrity of artists’ films that explore the formal elements of 16mm is at risk when they’re seen in another format”—acknowledgment of the effect changing format has on original content and experience. Keywords: format, 16mm film, production, arthouse cinema

Deals with the contradictory attitudes on film noise (avoided in contexts that aim to conceal the medium, and desired for aesthetic and nostalgic reasons) and noise’s relation to images in a broad artistic context. Describes many films that utilize noise deliberately as components of sound and image. Keywords: film sound, noise, experimental film, structuralism, aesthetics


Maybe not super relevant since it focuses on sound rather than image (?) Describes the ability of digital technology to “displace a perceptive faculty into the technological apparatus itself” and musical genres that complicate the ideal of high-fidelity reproduction. Keywords: music, digital technology, production, glitch music, high-definition, high-fidelity


Argues that avant-garde practices of glitch and circuit-bending in the consumption and creation of art can promote more interactive and critical engagement with art. Also argues that “media composers” write in collaboration with technologies rather than on it, and that glitches and other irregularities are essential features of technologies as agential systems. Provides many examples of glitch art that could be useful. Keywords: glitch, experimental art, circuit-bending, mediation

Old article about the rise of super 8mm in cartridge form. An interesting look at notions of the future formats in this era. As can be observed in the article, concerns about compatibility, standardization, interoperability, lasting ability, and interchangeability are already prescient in this era of film technology. The authors also discuss magnet sound—the role of magnets in many formats contributes to their fast deterioration.

Keywords: format, super 8, 16mm, compatibility, standardization

Kane, L. Carolyn. "Compression Aesthetics: Glitch from the Avant-Garde to Kanye West." InVisible Culture no. 21 (Fall, 2014).

Discusses a number of artworks and music videos that use glitch and similar simulated DIY aesthetics in order to contradict the sleek visuals of contemporary computer culture, but that because of their intentionality and budgets, do not meaningfully critique this culture. Creates a distinction between deliberate glitch effects and genuine glitches. Might not be super helpful, but is an interesting consideration of glitch aesthetics in mainstream pop culture. Keywords: glitch, aesthetics, compression, commodification

doi:10.1080/15551390802620910.

Damage in visual media is the center of this project, making this a relevant article. It compares photochemical and digital images and discusses the processes of decay and glitch that affect them. Article is locked behind a paywall, but hopefully I can find a free version of the full text somewhere. Keywords: deterioration, damage, digital, film, glitch, artifacts, archives, encoding

Discusses film restoration—whether a restoration should strive to be a duplication of the original, how distinct formats affect the film image, and outlines a history of film restoration practices. This chapter focuses mostly on early black and white restorations of early color films. Keywords: restoration, remasters, format, early film, nitrate film, preservation, archives


About the distorted images that result from networks of piracy in Nigeria. Because of the conditions of transmission of this media, the media becomes degraded—resulting in eroded data storage, poor image and sound quality, interference, noise, and distorted sound. This deterioration of material qualities as a result of repeated transmission is one of the central themes of this project. Keywords: infrastructure, transmission, piracy, degradation, resolution, glitch, noise


An account by an audiovisual archivist of their experiences working with video collections in a film-oriented archive. It describes the lack of resources devoted to the conservation of video. Furthermore, the analog experts whose knowledge has been passed down have used language and terminology that is now inaccessible to many, making video archiving difficult without this lost and forgotten knowledge. A few good quotes in here, plus descriptions of videotape processes of decay. Keywords: Videotape, decay, archives, preservation, restoration

Presents three “remediations” of *Voyage dans la Lune*. It argues that the ideal of technical purity in digital restoration prevents the spectator from properly observing the film as a historical object. Relevant in the way that it looks at restoration of a seminal film across formats and at the way content and spectatorial experience can be transformed by this.

Keywords: conservation, remasters, restoration, film to digital, remediation


Outlines the history of the standardization of 35mm film leads. Relevant in the way that it examines how aesthetics are changed from version to version. Not the most useful for this project, but an interesting look at an often-ignored aspect of the 35mm format.

Keywords: 35mm, standardization, format, aesthetics, history


Considers a number of dilemmas surrounding film restoration and archive practices by using Peter Jackson’s digital restoration of world war 1 footage from 2018 as a jumping-off point. It refers to the work done in this remaster as “digital enhancement,” which indicates that the author believes this additive manipulation may not be a true representation of the past. Interesting thoughts about the depiction of reality and the veracity of a format. *They Shall Not Grow Old* is also an interesting subject for study in terms of remediation and format. Keywords: restoration, historical film, documentary, digital, archives, resolution, relation to the real

Uses art installations and performances by Sandra Gibson and Luis Recoder about the specificities of film projection in order to investigate what about film, format, and technology constitutes “cinema.” Argues that even though a digital image and a projected 35mm may look identical, their “elementary structures” are radically different. Also discusses different formats and standards of film, including reduction prints. Keywords: projection, format, spectatorship, experimental art, technology


Provides a pre-digital perspective on the image qualities provided by film and by tape. It describes the contradiction between “film look” ideals and claims that video looks better. Describes a number of differences that are manifested in the image between formats. A useful resource for understanding format-specific traits and historical notions of image quality, resolution, and practicality. Keywords: Videotape, film, image quality, resolution, television, production


This article describes the dynamics of film-to-video transfer technology in the 1970’s and the considerations taken by filmmakers and when making the decision to adapt a film this way. The author detail in technological terms the differences in image information between film and tape, including the fact that film negatives demanded greater care and safety than tape. He also describes the appearance of grain and noise in the film-to-video transfer and the technologies that help negate these qualities. The most relevant takeaway from this is about the cumulative nature of graininess—noise and grain become more and more apparent through each generation of transfer and postproduction. Keywords: film grain, film noise, format, history, transfers, image quality, lighting, color

This piece covers the observable flaws—temporary or permanent—of film as a result of its degradation or replaying. It deals directly with the physical nature of a film strip and its propensity for decay. This decay can affect the image, and in some cases, obscures it or disrupts it. This is a main concept of my project, so this is a valuable article if I can figure out how to get past the paywall. Keywords: decay, aesthetics, nitrate film, projection, degradation


Describes the results of the DAVID project, a project that studies how to preserve digital audio-visual content. Their research project on preservation metadata standardization aimed to address issues associated with the format, including obsolescence, degradation, and the detection of damage. This article may be useful for its descriptions of what issues of decay face digital content and its findings on solutions. Keywords: digital video, preservation, storage, archives, standardization,


Explores digital archives, and the digital decay that plagues them—“digital decay refers to the process of degradation that results in glitches, imperfections, pixilation, and general incompatibility that comes with shifting file formats, new technologies, new software, and new hardware devices in the digital sector.” The author cites Walter Benjamin, who theorizes that through reproduction, art loses the power of its aura. Very relevant article for its discussion of digital decay, changing formats, and authenticity of
reproductions. Keywords: decay, digital archive, glitch, incompatibility, format, software, hardware, reproduction, authenticity, preservation


Here, the author puts forward the idea of restoration as simulacrum. He uses restorations of Fritz Lang’s *Metropolis* as a case study for analyzing differences between a restored film and its model, and to whether a restoration is a “technological enhancement,” as is marketed, or an interpretation or approximation. Useful in the sense that it’s about the changing status of an image after repeated reproductions or transfers. Keywords: simulacrum, restoration, authenticity, relation to the real


Discusses electronic methods of detecting and concealing film imperfections such as grain, dirt, scratches, and unsteadiness. Keywords: film grain, film imperfection, film to digital


This article deals directly with notions of format, compression, and the status of the image, and engages with Hito Steyerl’s writing on “poor images” and Jonathan Sterne’s on format theory. It also discusses the role of perception in determining the quality of high definition or low definition image. They use De Palma’s film *Redacted* to argue that there exists a “capital of the visible” composed of the imperceptible or “surplus” definition of certain formats. Keywords: format, glitch, capitalism, perception, compression, credibility, image quality, resolution, low definition images

Argues that the slow disaster facing film archives is no longer the decay of nitrate film, but acetate rotting away in unsatisfactory stores that fail even to meet standards for preservation. He argues that film archivists are guilty of ignoring “slow disasters,” or gradual processes of decay that affect audiovisual materials and their comprehensibility. He points out that nitrate film was never given suitable attention for its preservation, and that acetate film—its “more stable” replacement—is just as unstable. Also about cellulose-plastic decay. Keywords: film decay, archives, preservation, nitrate film, format


This is a very technical article about compression methods of low frame rate video. The existing methods of compression do not compensate for frame rate, and can result in low definition images, artifacts, and poor quality. Keywords: frame rate, digital video, compression, low definition images

Entertainment Publications:


About the problems that 4K video poses for streaming companies without the bandwidth and delivery infrastructure necessary. The solution comes in the form of compression—“compression turns the beautiful but huge digital images coming out of video cameras into smaller, but hopefully still beautiful, digital files.” An interesting
aspect of this article is that it was written in 2013, when streaming of 4K video was a possibility given sufficient compression technology. Now, the ability to stream very high definition video is possible. Keywords: high definition, compression, streaming, television, image quality, resolution, bitrate

**Online Journals and Publications:**


This article delves into the reasons why some moviegoers prefer the look of movies shot on film versus digital cameras and what the minute differences between the mediums might be. Explores the history behind the various mediums and when one began to become favored over another. A broad technical overview of how both formats operate.

Keywords: film, digital, format, 35mm, video, industry


Hito Steyerl discusses her argument against the fixation on hyper detailed images and the value and charm to be had in a poorer quality image. The author writes how imperfect cinema is often the one that challenges the most, and breaks the most ground. Films of lower resolution are more easily accessible to produce as well as access. Her thoughts on the poor images that result from format degradation could be useful for this project.

Keywords: degradation, resolution, image quality, aesthetics


About the issues that come from mass collection of data in surveillance states, and the interpretations of certain data noise called “dirty data”. The piece discusses how
misinterpretation and misunderstandings of false patterns can be disastrous and dangerous. Data noise is a form of format imperfection that I’d like to include in this project. Keywords: data, surveillance, glitch, digital noise, pattern recognition


This article discusses how valuable precious information is nearly lost when stored on technology from decades ago. The difficult ability to run old software on new machines or find older machines operational is a challenge plaguing archivists and historians. It extends this discussion to film degradation, magnetic tapes losing polarisation, as well as legal issues abound in this process. Keywords: videotape, obsolescence, format incompatibility

Videos:


This video displays (in an exaggerated way) how compression affects the resolution and readability of a video when uploaded to Youtube and how those compromises can be amplified over time through repeated downloading and reuploading. It does not take very many uploads for the compression to completely overtake the image and make it nearly unintelligible. Clips of this could be used to demonstrate the impact of repeated transmission and compression on an image.

Reeves buried 16mm film and allowed it to be decomposed by fungi and enzymes in order to create this “moving painting.” While meant to express concern for the obsolescence of 16mm film and for the effect of discarded technology on the
environment, this piece depicts the degraded, decaying, or imperfect image in an extreme way. It represents the inevitable final destination of an image.


This video explores the intersection of quirks in human eyesight and perception, and visually demonstrates shortcomings of video codec compression with regard to dark scenes and images. Exemplifies glitch and the way that standards of compression creates compromise in an image.


This video explores the shortcomings of video codec compression with regard to displaying many different colors moving at once in an image. Because compression works by deleting visually redundant or static color information, when too much of the image is non-static and multicolored, video compression struggles to maintain a pleasing high quality image at the same bit-rate.

Books:


A review for the book writes it “reads like a richly detailed travel memoir contained to a single street, offering the reader access to an architectural archive of the history of film exhibition. Barber’s book successfully combines film analysis and architectural analysis, providing a new framework for discussions of the end of film.” The author describes what happens to images after their end. Focuses more on industry and cultural practices of projection and exhibition. Keywords: spectatorship, format, film to digital

This book describes the materiality of electronics from a unique perspective, examining the multiple forms of waste that electronics create as evidence of the resources and labor that are bundled into these machines. It is a study of the material life of information and its devices and of electronic waste in its physical and electronic incarnations. Deals with the breakdown, obsolescence, and ultimate disposal of media technology.


Highlights the role of noise, glitch, and error in the creative practices of digital culture. Focuses on the noisy channels of computer-mediated communication. Focuses on glitch in a creative and cultural context. Keywords: glitch, noise, digital culture, experimental art


A collection of essays that attempts to make sense of the drastic changes in the preservation and exhibition of film in the 21st century. For one thing, streaming took over the world as the predominant way of experiencing moving images and private space superseded public space as the primary site of these experiences. The predominance of the digital has transformed many aspects related to film archives, and exhibition, restoration, and production now take place as digital processes. Keywords: archives, digital culture, digital archives, spectatorship, preservation, production, cultural history


Menkman’s work is the basis of the inspiration for this project. She not only produces art that makes visible and deconstructs processes of compression, glitch, and change in format; she also writes about these subjects in a rich theoretical way. I hope to utilize her imperfect images and statements as part of my project. Keywords: glitch, compression, format, standardization, databending, simulation, glitch art, networks

The first chapter of this book, by Jonathan Sterne, covers the topic of compression and its operation throughout media history before its usage as reference to data or dynamic range compression. Other chapters about media infrastructure may also be useful to reference. Cloud infrastructure and related technologies could present the most recent and abstract format that I will include. Keywords: compression, media infrastructure, data, standardization


Forms the basis of this project and provides the essential framework of “format theory” that I will follow. It also challenges notions of media technology as evolving toward veracity or high quality, as is evidenced by compression practices and cultural tendencies toward imperfect media. Although he focuses on the MP3 format and histories of audio technology, his analysis is equally as applicable to visual media. Keywords: format, compression, standardization, audio media, data, bitrate

Additional sources to look into:
- Slide, Nitrate Won't Wait: A History of Film Preservation in the United States.
- Richardson, “Film Damage! What's the Real Cause?”, in Moving Picture World.