Course Description

New York University Moving Image Archiving and Preservation
CINE-GT 3403, Video Preservation 1
Mondays, 6:00pm - 9:00pm
665 Broadway, Room 643 Fall 2018
Course Syllabus | v0.10

Video preservation calls for a diverse range of skills, with electrical systems, mechanical systems, signal processing electronics, chemical breakdown, digital file formats, archival standards, project management, and media history all competing for attention. In this class--the first in a two-semester course of study--students will be introduced to the basics, with a particular focus on optimizing digitization through the careful handling of videotapes and playback devices. Topics will include: the development of television and video technologies, open source tools and their impact on the archival community, working with (and building your own) video digitization station, manipulating and testing video files post-digitization, and troubleshooting, troubleshooting, troubleshooting. While we'll focus on the practical, some of the larger questions--what gets saved, and who gets to do the saving--won't be ignored.

Instructors

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Resource Directory:
https://drive.google.com/drive/u/1/folders/0BxYHavxhGzAzbE44OUpNdlBSU1U

Learning Objectives

At the conclusion of this class, students will have gained:
- A thorough understanding of video signals—how they're created, recorded onto tape, and extracted through digitization
- The ability to identify (and properly prepare for digitization) a range of video formats
- Working knowledge of commonly used video preservation software tools (proprietary and open source)
- Experience troubleshooting hardware/software problems, and the confidence to resolve unexpected issues (should/when they arise)

Expectations

First and foremost, students are expected to participate and engage in class discussions and demonstrations. Class participation and a suitable level of preparedness will account for 20% of the overall grade, with 80% of the grade based upon the results of the two assignments (outlined below). Attendance is mandatory, and students should consult with instructors before October 1st if they expect to miss any classes. Students are expected to complete their final assignment during class lab hours, though additional sessions can be arranged with the instructors or MIAP Technician.

Course projects will be submitted in electronic form by the beginning of the class period on the due date. Assignments should be uploaded to the appropriate folder in this [Google Drive directory](#). Change the permissions so that only your instructors can view the work. Your work may be made part of the MIAP Digital Archive in a private space for faculty use, and on the MIAP web site, where appropriate. Please inform the professors of any papers that cannot be published on the web due to confidentiality restrictions or other reasons, or if you have other concerns about your work being posted. In some cases, the title of a paper may be published, but access to the paper will be restricted to selected MIAP faculty and staff. When electronic files are submitted, the file names must conform to the standard format:

year semester_class number_author's last name_assignment number.extension

Example: 05s_1800_Smith_a1.doc

Assignments

Assignment #1, Due October 8th, 2018

Each student will write a review of one of the following topics and prepare a brief (5 minute) presentation for the class about what they've learned. Write-ups should focus on (1) the technical makeup of the component; (2) a brief review of its history; and (3) its significance in digitizing videotapes. The paper should be between 800 - 1200 words at minimum. Sources must be cited. Students will each choose from the following:

- Serial Digital Interface
- Component Video
- Timecode
- Baking Tapes
- Dropout and Dropout Compensation
- Color-under recording systems
- RF (Radio Frequency)
- Low-band, High-band, and SP (Superior Performance)

- K-Factor
- Signal-to-Noise Ratio
- Waveform monitor
- Vectorscope
- Time-base corrector (TBC)
- CRT Monitor
- Analog/Digital Converter
- Black Burst/Genlocking
- RS-422

Assignment #2, Due November 18th, 2018

Students will act as their own preservation units, and will be tasked with (1) digitizing a U-Matic videotape, (2) creating derivatives and performing quality control on all resulting files, and (3) packaging all related assets. The final deliverables should be transcoded using FFmpeg and packaged using BagIt. Each "bagged" package should be named with the same unique identifier as the tape, and include the following:

- 1 preservation master file (ffv1/mkv) and corresponding framemd5
- 1 mezzanine file (prores hq 4:2:2/mov)
- 1 access file (h264/mp4, pillarboxed and deinterlaced)
- 1 QCTools report
- 1 Transfer Log

All files should meet preservation standards for file specifications and broadcast range. Notes provided in the transfer log should identify the Preservation Technician, the Quality Control Technician, and contain detailed information about the transfer environment, adjustments that have been made to the video and audio signals, and any errors and anomalies that occurred during transfer.

Lab

Four classes, weeks 6 thru 9, will start with a short lecture followed by scheduled lab hours for the students to complete their final digitization projects. Lab hours extend to 10pm on these days. Please schedule your lab times [here](). Each student should schedule at least one transfer session and one encoding session. Only students transferring on the last day (November 12th) can encode on that day. If you are not scheduled to transfer or encode on that day, you can leave class after the lecture.

Classes

WEEK 01 | SEPTEMBER 10, 2018 | LECTURE

The Error-Filled Road Ahead: Video Basics, Physical Carriers, and Introduction to Anomalies
After getting-to-know-you opening remarks, we'll review the landscape of video and video preservation, introducing video signal basics, the seemingly endless variety of physical video formats, and how to critically view and identify errors by format.

- Read
    - How Video Works, "Video Scanning" pg. 15-24 (9 pages)
    - How Video Works, "Synchronizing Signals" pg. 25-37 (12 pages)
    - How Video Works, "Color Video" pg. 53-68 (15 pages)
    - How Video Works, "The Encoded Signal" pg. 113-122 (9 pages)
    - How Video Works, "Television Standards" pg 135-152 (16 pages)
- Watch
    - How 2" Quad Machines Worked, https://www.youtube.com/watch?v=fpBRuheelu4

WEEK 02 | SEPTEMBER 17, 2018 | LECTURE & EXERCISE

Sticky Shed Fingers: Magnetic Media Conservation You Can't Keep Away
Without further referencing the Rolling Stones' best album, this class will cover one of the most important aspects of video preservation—triage, the preparing tapes for digitization through cleaning (by machine and by hand), baking, other weird treatments.

Group exercise: After selecting the U-matic tapes they will transfer as part of their final assignment, students will open the cassette in mock preparation for baking.

- **Read**
    - Crystal Sanchez, "Heating Things Up: A History of Baking Tapes for Video Preservation" https://www.nyu.edu/tisch/preservation/program/student_work/2010fall/10f_2920_sanchez_a2a.pdf

- ○ Presto Space, "D6.1 : Report on video and audio tape deterioration mechanisms and considerations about implementation of a collection condition assessment method." (Pages 8-13)
  https://drive.google.com/drive/u/1/folders/0BxYHavxhGzAzX3E2cW5Bb0I2N2M
  - ○ Peter Brothers, "Common Signs of Problem Tapes (U-Matic and Betacam)"
    http://www.specsbros.com/uploads/7/1/9/0/71903471/digi_9_common_cassette_probl ems_rev_2.pdf
  - ○ Peter Brothers, "Basic Inspection Techniques to Sample the Condition of Magnetic Tape"
    http://www.specsbros.com/uploads/7/1/9/0/71903471/white_pages-_basic_inspection_ techniques9.pdf

WEEK 03 | SEPTEMBER 24, 2018 | LECTURE

The Rack: Components, Signal Flow, Monitoring, Calibration, and Testing
Now that we've gotten a handle on the different types of video signals (and how they're recorded onto tape), we'll begin our extended adventure into working with/building/troubleshooting video digitization stations.

- **Read**
  - ○ How Video Works, "Monitoring the Color Image,"
  - ○ How Video Works, "Analog Waveform Monitors," "
  - ○ How Video Works, "Analog Vectorscopes."
  - ○ IASA TC-06, "Guidelines for the Preservation of Video Recordings" D.1.3 Setting up and testing a digitising facility and system, D.1.4 Operating a digitising facility and system
    https://www.iasa-web.org/sites/default/files/publications/IASA-TC_06-D_20180611.pdf

WEEK 04 | OCTOBER 1, 2018 | LECTURE & GROUP ACTIVITY

BYO (Build Your Own) Digitization Station, featuring Mr. Patch Bay
This week we'll welcome a special guest: former MIAP Technician Ethan Gates. Together we'll build our own digitization station, putting together all of the physical components and loading a Mac computer with the necessary tools and software.

- **Read**
  - ○ Ethan Gates, The Patch Bay Blog, "Upgrading Video Digitization Stations"
    https://patchbaytech.wordpress.com/2017/03/02/upgrading-video-digitization-stations
  - ○ XFR Collective, Github, "Workflow Documentation"
    https://github.com/XFRCollective/WorkflowDocumentation
  - ○ Various, "Minimum Viable Station Documentation"
    https://docs.google.com/document/d/1oJvr8zCMK4A97GF9xYOM0uijDqyNStuwjtZ23y MRkGw/edit
- **Watch**
  - ○ Butterscotch.com YouTube Series: "Get to know Mac Hardware"
    https://www.youtube.com/playlist?list=PL3DA253BA9BFE8A60

--NO CLASS OCTOBER 8TH, 2018--

We Interrupt This Program…: Mid-term presentations and lab demonstration: Assignment 1 is due today. Each student will give a five minute presentation on their topic, with an additional five minutes dedicated to answering questions. Afterwards, we'll discuss the details of the final assignment. Instructors will give a lab demonstration to prepare students for digitization.

- **Read**
    - MIAP Lab Transfer Checklist (link TBA)

Codecs, Conformance, Standards: Preservation digital file formats and their discontents
Our first official lab week! Before lab, we'll take a deep dive into the different kinds of file formats used in video preservation, and learn how to use MediaConch to ensure that digital files conform to these standards.

- **Bring**
    - Laptop. If you can't bring your own, Blanche can provide you with a MIAP loaner (just make sure to give her a few days notice).
- **Read**
    - Savannah Campbell, "The Great Video Codec Debate" https://www.nyu.edu/tisch/preservation/program/student_work/2016fall/16f_1807_Campbell_a2.pdf
    - Dave Rice, "Audiovisual Adherence." Tate Research Publications http://www.tate.org.uk/research/publications/audiovisual-adherence
    - Kate Murray, The Signal Blog , "New FADGI MXF AS-07 Specification and Sample Files Published" https://blogs.loc.gov/thesignal/2017/10/new-fadgi-mxf-as-07-specification-published/
- **Skim**
    - FADGI Digital File Formats for Videotape Reformatting Part 5. Narrative and Summary Tables http://www.digitizationguidelines.gov/guidelines/FADGI_VideoReFormatCompare_pt5_20141202.pdf

- **Download**
    - Homebrew (macOS only)
    - MediaConch GUI [https://mediaarea.net/MediaConch/]
    - MediaConch CLI [brew install mediaconch]

Digitization is Half the Battle, Part I: Introducing FFMPEG
In a shockingly brief period of time, the open source software FFmpeg has moved from the margins to center, becoming an indispensable tool of media preservation. The answer to the question "How do I do X with my audio or video files?" is almost always answered with FFmpeg. Transcoding, metadata inspection, checksumming, dealing with strange media—these just a few of the things that are in

FFmpeg's wheelhouse. The first half of class will be an introduction to FFmpeg; the second half lab time. Ben and Kelly will also report back on their time at the No Time to Wait 3 Conference.

- **Bring**
  - Laptop. If you can't bring your own, Blanche can provide you with a MIAP loaner (just make sure to give her a few days notice).

- **Download**
  - FFmpeg (follow the instructions provided on Reto Kromer's website)
    https://avpres.net/FFmpeg/install_Apple.html
    https://avpres.net/FFmpeg/install_Windows.html
- **Read**
  - FFmprovisr, particularly "FFmpeg Basics," "Advanced FFmpeg Concepts," and all recipes under the "Preservation Tasks" banner
    https://amiaopensource.github.io/ffmprovisr/
  - FFmpeg man pages (in terminal, type "man ffmpeg")

WEEK 08 | NOVEMBER 5, 2018 | LAB & LECTURE

Digitization is Half the Battle, Part 2: Exercises with FFMPEG
Before lab, we'll spend an hour doing exercises with FFMPEG based on what we learned in the previous class and help students complete their encodings.

- **Bring**
  - Laptop. If you can't bring your own, Blanche can provide you with a MIAP loaner (just make sure to give her a few days notice).

WEEK 09 | NOVEMBER 12, 2018 | LAB & LECTURE

Any Quality Control is Better Than No Quality Control
Why check your work? Because no matter how careful you are, something will inevitably go awry. *That* is the nature of video preservation, and hopefully by this point in the semester you've experienced some sort of weirdness that's required troubleshooting/rework. In the lecture portion of this week's class, Ben and Kelly will break down the different types of quality control (automated and manual) and give a thorough review of the free and open source QCTools.

- Read
  - QCTools' online documentation
  - Ashley Blewer's AV Preservation Training module on QCTools
  - IASA TC-06, "Guidelines for the Preservation of Video Recordings"
    - D.1.1.4 Quality assurance, control, and critical control points
    - D.1.1.5 Quality control: how much science, how much art?
    - D.1.1.6 Broadcast community quality control initiatives for file-based video
    - D.1.4.3 Critical control factors: operating a digitising facility and system
    https://www.iasa-web.org/sites/default/files/publications/IASA-TC_06-D_20180611.pdf

-----------------------**FINAL ASSIGNMENT DELIVERED BY NOVEMBER 18TH**--------------------------------

Herding Cats: Preservation Project Management for Your Soul
Breaking away from the technical side of video preservation, the lecture portion of this class will cover an often-ignored skill-set that can make or break a project: management. We'll learn about project management frameworks popular in software development (Scrum, Agile) and how they are often applied in tape-to-file preservation projects large and small. Afterwards, we'll eat some cookies and review student work in front of the class via QCTools and the magic of projection.

- **Read**
  - Federal Agencies Digitization Guidelines Initiative, "Digitization Activities: Project Planning and Management Outline."
    http://www.digitizationguidelines.gov/guidelines/DigActivities-FADGI-v1-20091104.pdf
- **Skim**
  - Digital Libraries Federation, "DLF Project Manager's Toolkit
    https://wiki.diglib.org/DLF_Project_Managers_Toolkit
  - Nick Jenkins, "A Project Management Primer"
    https://archive.org/details/ProjectPrimer
- **Watch**
  - Michael Casey, "An Inside Look at Managing MDPI Digitization."
    https://media.dlib.indiana.edu/media_objects/1g05fg07r

Important Policies and Resources

Tisch Policy on Academic Integrity
The core of the educational experience at the Tisch School of the Arts is the creation of original work by students for the critical review of faculty members. Any attempt to evade that essential transaction through plagiarism or cheating is educationally self-defeating and a grave violation of Tisch's community standards. Plagiarism is presenting someone else's original work as if it were your own; cheating is an attempt to deceive a faculty member into believing that your mastery of a subject or discipline is greater than it really is. Penalties for violations of Tisch's Academic Integrity Policy may range from being required to redo an assignment to dismissal from the School. For more information on the policy--including academic integrity resources, investigation procedures, and penalties--please refer to the Policies and Procedures Handbook (tisch.nyu.edu/student-affairs/important-resources/tisch-policies-and-handbooks) on the website of the Tisch Office of Student Affairs.

Health & Wellness Resources
Your health and safety are a priority at NYU. If you experience any health or mental health issues during this course, we encourage you to utilize the support services of the 24/7 NYU Wellness Exchange 212-443-9999. Also, all students who may require an academic accommodation due to a qualified disability, physical or mental, please register with the Moses Center 212-998-4980. Please let your instructor know if you need help connecting to these resources. Students may also contact MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu) for help connecting to resources.

Sexual Misconduct, Relationship Violence, and Stalking Policy & Reporting Procedures
NYU seeks to maintain a safe learning, living, and working environment. To that end, sexual misconduct, including sexual or gender-based harassment, sexual assault, and sexual exploitation, are prohibited.

Relationship violence, stalking, and retaliation against an individual for making a good faith report of sexual misconduct are also prohibited. These prohibited forms of conduct are emotionally and physically traumatic and a violation of one's rights. They are unlawful, undermine the character and purpose of NYU, and will not be tolerated. A student or employee determined by NYU to have committed an act of prohibited conduct is subject to disciplinary action, up to and including separation from NYU. Students are encouraged to consult the online Sexual Misconduct, Relationship Violence, and Stalking Resource Guide for Students (nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/sexual-misconduct--relationship-violence--and-stalking-resource-.html) for detailed information about on-campus and community support services, resources, and reporting procedures. Students are also welcome to report any concerns to MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu).

Non-Discrimination and Anti-Harassment Policy & Reporting Procedures
NYU is committed to equal treatment and opportunity for its students and to maintaining an environment that is free of bias, prejudice, discrimination, and harassment. Prohibited discrimination includes adverse treatment of any student based on race, gender and/or gender identity or expression, color, religion, age, national origin, ethnicity, disability, veteran or military status, sexual orientation, marital status, or citizenship status, rather than on the basis of his/her individual merit. Prohibited harassment is unwelcome verbal or physical conduct based on race, gender and/or gender identity or expression, color, religion, age, national origin, ethnicity, disability, veteran or military status, sexual orientation, marital status, or citizenship status. Prohibited discrimination and harassment undermine the character and purpose of NYU and may violate the law. They will not be tolerated. NYU strongly encourages members of the University Community who have been victims of prohibited discrimination or prohibited harassment to report the conduct. MIAP students may make such reports to MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu), or directly to Marc Wais, Senior Vice President for Student Affairs. Students should refer to the University's Non-Discrimination and Anti-Harassment Policy and Complaint Procedures (nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/non-discrimination-and-anti-harassment-policy-and-complaint-proc.html) for detailed information about on-campus and community support services, resources, and reporting procedures.

NYU Guidelines for Compliance with the Family Educational Rights and Privacy Act (FERPA)
The Family Educational Rights and Privacy Act of 1974 (FERPA) was enacted to protect the privacy of students' education records, to establish the rights of students to inspect and review their education records, and to provide students with an opportunity to have inaccurate or misleading information in their education records corrected. In general, personally identifiable information from a student's education records, including grades, may not be shared without a student's written consent. However, such consent is not needed for disclosure of such information between school officials with legitimate educational interests, which includes any University employee acting within the scope of their University employment. See here (nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/FERPA.html) for full policy guidelines.

NYU Academic Support Services
NYU offers a wide range of academic support services to help students with research, writing, study skills, learning disability accommodation, and more. Here is a brief summary:

NYU Libraries
Main Site: library.nyu.edu; Ask A Librarian: library.nyu.edu/ask
70 Washington Square S, New York, NY 10012
Staff at NYU Libraries has prepared a guide (http://guides.nyu.edu/c.php?g=276579&p=1844806) covering services and resources of particular relevance to graduate students. These include research services and guides by topic area, subject specialists, library classes, individual consultations, data

services, and more. There's also a range of study spaces, collaborative work spaces, and media rooms at Bobst, the library's main branch.

The Writing Center
nyu.mywconline.com
411 Lafayette, 4th Floor, 212-998-8860, writingcenter@nyu.edu
The Writing Center is open to all NYU students. There, students can meet with a faculty writing consultant or a senior peer tutor at any stage of the writing process, about any piece of writing (except exams). Appointments can be scheduled online. Students for whom English is a second language can get additional help with their writing through a monthly workshop series scheduled by the Writing Center (cas.nyu.edu/content/nyu-as/cas/ewp/writing-resources/rise-workshops.html).

The University Learning Center (ULC)
nyu.edu/ulc; Academic Resource Center (18 Washington Pl, 212-998-8085) or University Hall (110 East 14th St, 212-998-9047)
   Peer Writing Support: All students may request peer support on their writing during drop-in tutoring hours for "Writing the Essay / General Writing" at the University Learning Center (ULC), which has two locations noted above. Students for whom English is a second language may wish to utilize drop-in tutoring geared towards international student writers (see schedule for "International Writing Workshop").
   Academic Skills Workshops: The ULC's Lunchtime Learning Series: Academic Skills Workshops focus on building general skills to help students succeed at NYU. Skills covered can help with work in a variety of courses. Workshops are kept small and discuss topics include proofreading, close reading to develop a thesis, study strategies, and more. All Lunchtime Learning Series workshops are run by Peer Academic Coaches.

Moses Center for Students with Disabilities
nyu.edu/students/communities-and-groups/students-with-disabilities.html
726 Broadway, 3rd Floor, 212-998-4980, mosescsd@nyu.edu
All students who may require an academic accommodation due to a qualified disability, physical or mental, are encouraged to register with the Moses Center. The Moses Center's mission is to facilitate equal access to programs and services for students with disabilities and to foster independent decision making skills necessary for personal and academic success. The Moses Center determines qualified disability status and assists students in obtaining appropriate accommodations and services. To obtain a reasonable accommodation, students must register with the Moses Center (visit the Moses Center website for instructions).