MOVING IMAGE ARCHIVING & PRESERVATION PROGRAM
DIGITAL PRESERVATION, H72.1807

Version 3: 9/9/09

Fall 2009 - Wednesdays, 12:30 pm – 4:30 pm
(please note classes are not necessarily every other week. See schedule for details.)

665 Broadway, Room 643

Instructor: Chris Lacinak: chris@avpreserve.com; 917-548-8632; Skype: clacinak; Gtalk: avpreserve

Goals

Expectations

Housekeeping Must Read

Assignments and Grading

Class 1: Wednesday, September 9 – Introduction, Technology History; OAIS and Preservation Principles in the context of Digital Preservation Principles

Class 2: Wednesday, September 23 – Still Image Digitization; AV Digitization Theory; File Formats

Class 3: Wednesday, September 30 (Assignment Plan Due) – AV Digitization Practice

Practice Lab: Monday, October 19 – Video/Digital Lab Practice

Class 4: Wednesday, October 21 – Digital Workflows; Preservation Lifecycle; Digital Rights Management

Class 5: Wednesday, November 11 – Practical Work with Digital Files; Repository Metadata; Repository System Landscape & Repository Sustainability

Class 6: Wednesday, November 25 (Assignment Due) – Storage architectures; Relevant Calculations; Trusted Digital Repositories; Digital Asset Management

Plagiarism Advisory

GOALS:

This class will focus on the entire digital preservation lifecycle of moving image and sound content. We will begin with digitization and born digital objects, continuing on to storage and asset management systems, and through migration and reformatting. Current theories and practices for digital preservation will be explored through readings and lectures. Students will gain practical skills required in the emerging role of the moving image and sound archivist. These skills include identification, working with metadata, data integrity practices, reviewing and interpreting digital objects and their content. Emphasis will be placed on the role of the moving image and sound archivist in fulfilling their charge of digital preservation.

EXPECTATIONS:

A blackboard site will be available for this course. Students will be expected to check in on the site several times a week for updates and participation. Students are encouraged to pass along resources for the benefit of the class.

Attendance and participation in all classes is expected. Please speak to me about all absences in advance of the absence; one unexcused absence will substantially affect your grade as the classes are doubled up into 4-hour blocks. Each class will include at least one 20-minute break.

Please note that all written work must utilize proper citations, including proper web citations. Works that do not include complete citations will be returned for revision and considered late. Also, please read the Plagiarism Advisory at the end of the syllabus.

Work that is handed in late will be subject to a reduction in grade, affecting your overall grade.

HOUSE KEEPING

MIAP Digital Archive: All course papers/projects must be submitted to me in electronic form, following the format and file naming protocol described in "Digital Archive Protocol Revision 2_4.rtf". The materials will be made part of the MIAP digital archive in a private space for faculty use, and on the MIAP web site.

Texts: It is not necessary to purchase books for the course – Most are on the web; articles will be put on reserve in the Bobst Library as needed. Please note: Some readings may have been assigned in other classes in the Moving Image Archiving and Preservation Program; however, some repetition is necessary to create a context. It is expected that you will review these readings before class time to re-familiarize themselves with the concepts.

Access to Computer Labs: Please see http://www.nyu.edu/its/labs/ for locations and descriptions of NYU's computer labs as needed to work on your computer-related assignments.

Cell phones: Turn completely off during class.

ASSIGNMENTS AND GRADING:

Each student will do one assignment as described below. Grades will be based on a combination of class preparedness, participation in class and on blackboard (70%); and one assignment (30%).

- Assignment: Each person will be assigned an integral "component" of the digital object's lifecycle. Using what you learn in class and the sustainability factors outlined here http://www.digitalpreservation.gov/formats/sustain/sustain.shtml you will identify, research, analyze and report on the primary risk factors and considerations that should be considered when evaluating the component for use. You should:
  - o Consider the migration into and out of this component (the next migration)
  - o Consider audiovisual integrity, metadata integrity, functionality, labor and cost.
  - o Based on your analysis, provide no less than 3 recommendations for mitigating risk when selecting this component.
  - o Based on your analysis, if evident, provide your recommendation of the best available option.
  - o Consider and discuss what the negative implications are if one does not follow these recommendations or chooses poorly – give examples of real world scenarios where possible.
  - o Compare and contrast the available options in the context of these considerations.

  Components include:
  - o Asset Management System
  - o Database
  - o Destination/Target Preservation Master Codec
  - o Destination/Target Preservation Master Wrapper
  - o Backup solution (software and hardware)
  - o Storage Media (CD vs. Data Tape vs. Hard Disk, etc.)
  - o Metadata (fields and schema)
  - o Hierarchical Storage Management System
  - o Born Digital Video
  - o Born Digital Audio

  There will be an assignment plan due on Sept. 30th in which you should provide a brief description (a few paragraphs) of your initial thoughts including your approach, potential points of risk, possible recommendations, questions you have, a list of key people to speak with on the topic, at least 5 – 10 resources, and an initial outline for your document.

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Class 1: Wednesday, September 9 (top)

<u>Class Resources</u>

- Cornell University Library Research Department. "Setting the Stage: Introduction" in Digital Preservation Management: Implementing Short-term Strategies for Long-term Problems. Accessed 9/3/09 at http://www.icpsr.umich.edu/dpm/dpm-eng/timeline/index.html

- Cornell University Library Research Department. Sections Titled: "Obsolescence and Physical Threats" & "Terms & Concepts"->"Strategies" in Digital Preservation Management: Implementing Short-term Strategies for Long-term Problems. Accessed 9/3/09 at http://www.icpsr.umich.edu/dpm/dpm-eng/oldmedia/index.html http://www.icpsr.umich.edu/dpm/dpm-eng/terminology/strategies.html

- Arms, Caroline R. and Carl Fleischhauer. "Sustainability Factors" in Sustainability of Digital Formats: Planning for Library for Congress Collections. Accessed 9/3/09 at http://www.digitalpreservation.gov/formats/index.shtml

- Besser, Howard. "Digital Longevity" in Handbook for Digital Projects: A Management Tool for Preservation and Access. (Ed.) Maxine Sitts. Andover, MA: National Document Conservation Center. Accessed 9/3/09 at http://www.gseis.ucla.edu/%7Ehoward/Papers/sfs-longevity.html

- Definition of digital preservation Accessed 9/3/09 at http://www.ala.org/ala/mgrps/divs/alcts/resources/preserv/defdigpres0408.pdf

- 13 Ways of Looking at Digital Preservation: Accessed 9/3/09 at http://www.dlib.org/dlib/july04/lavoie/07lavoie.html

- Computer History Museum. Home page. Accessed 9/3/09 at http://www.computerhistory.org/

<u>Topics/activities:</u>
- Introductions, syllabus review – what will be covered in this class. (40 min.)

- ***Mona Jimenez*** will conduct an interactive review of computer technical history, structures, major developments and terminology, beginning in the 1940s. (1:10-2:40PM - 90 min.)

- ***Howard Besser*** will review preservation principles; compare traditional preservation to digital preservation; take a look at problems with digital longevity, according to frameworks proposed by a 1994 Task Force on Digital Information; and take an in-depth look at the OAIS activities. (3:00-4:30PM - 90 min.)

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Class 2: Wednesday, September 23 (top)

<u>Due this class</u>
Read the following:

- Cornell University Library Research Department. Sections linked to below in Moving Theory into Practice: Digital Imaging Tutorial. Accessed 9/3/09 at
http://www.library.cornell.edu/preservation/tutorial/intro/intro-01.html

  digital images
  resolution
  pixel dimensions
  bit depth
  dynamic range
  file size
  compression
  file formats

- Technical Advisory Services for Images. "File Formats and Compression". Last update 2005. Accessed 9/3/09 at
http://www.tasi.ac.uk/advice/creating/fformat.html

- Arms, Caroline R. and Carl Fleischhauer. Sections linked to below in Sustainability of Digital Formats: Planning for Library for Congress Collections. Accessed 9/3/09 at
http://www.digitalpreservation.gov/formats/content/still.shtml
http://www.digitalpreservation.gov/formats/content/sound.shtml
http://www.digitalpreservation.gov/formats/content/video.shtml
http://www.digitalpreservation.gov/formats/intro/intro.shtml
http://www.digitalpreservation.gov/formats/intro/format_eval_rel.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000001.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000003.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000059.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000183.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000081.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000127.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000028.shtml
http://www.digitalpreservation.gov/formats/fdd/fdd000052.shtml

- Video Interchange website. Vintage Audio Recording History. Only from "Sony PCM-F10 (1978) - PCM-F1 (1981)" to end. Accessed 9/3/09 at
http://www.videointerchange.com/audio_history.htm

- Video recording formats website. Read sections "uncompressed digital formats", "Digital formats employing compression" & "D series digital formats" to end. Accessed 9/3/09 at
http://users.tkk.fi/~iisakkil/videoformats.html

- Poynton, Charles. "Chroma Subsampling Notation". 2002. Accessed 9/3/09 at
http://scanline.ca/ycbcr/Chroma_subsampling_notation.pdf

- Dolphin Music. BlueFox Website. "What does the bit depth and sample rate refer to?" Accessed 9/3/09 at
http://www.bluefoxvideo.com/video-audio-articles/bit-depth-and-sample-rate.html

- Robin, Michael. "Digital Video Basics". Broadcast Engineering. May, 2004 issue. Accessed 9/3/09 at http://www.printthis.clickability.com/pt/cpt?action=cpt&title=Digital+video+basics&expire=&urlID=19485970&fb=Y&url=http%3A%2F%2Fbroadcastengineering.com%2Finfrastructure%2Fbroadcasting_digital_video_basics_2%2Findex.html&partnerID=99531

- European Broadcasting Union (EBU). "Broadcast Wave Format (BWF) user guide". 2007. Accessed 9/3/09 at http://www.ebu.ch/en/technical/publications/userguides/bwf_user_guide.php

Topics/activities:

- **We will meet at 12:30 at The Center for Jewish History at 15 West 16th Street, between 5th and 6th Avenues, New York, NY 10011**
Andrea Buchner of Center for Jewish History will give us a tour of the CJH still image digitization lab and speak about some of the projects they are working on. This will be followed by a lecture from Andrea about still file types and formats; vector vs. bitmap; typical metadata – embedded and external; color spaces and color management; strategies and standards, especially as they apply to maintaining digital images over time. (12:30-2:00PM - 90 min.)

- **Back at MIAP Lab**
Moving image and sound digitization theory and discussion of relevant digital tape and file formats (60 min)

- Check in, review of readings, Discussion of Assignment: (as time allows)

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Class 3: Wednesday, September 30 <mark>(Assignment Plan Due)</mark> (top)

Due this class:
- Assignment plan due

Read the Following:
Due this class:
- Assignment plan due: identifying contact information of people at organizations that you will speak to, a very brief background on the organization and why you chose them, allocation of responsibility for project completion, and an outline identifying points of focus for questioning.

Read the Following:
- Apple, Inc. Final Cut Pro 6 Manual. Ch. 17, 18, Appendix B & C. Find on Blackboard.

- Steinberg. Wavelab 6 Manual Section on Recording. pp. 147 – 154. Find on Blackboard.
http://videopreservation.stanford.edu/dig_mig/index.html

- Pohlmann, Ken. "Measurement and Evaluation of Analog-to-Digital Converters Used

in the Long Term Preservation of Audio Recordings" (roundtable discussion, "Issues in Digital Audio Preservation Planning and Management," Washington, DC, March 10-11, 2006). Also available online: http://www.clir.org/activities/details/AD-Converters-Pohlmann.pdf

Watch:
- Apple, Inc. Final Cut Tutorials on the web site of Apple, Inc. 2007. Retrieved 9/3/09 at
  http://www.lynda.com/home/Player.aspx?lpk4=54087
  http://www.lynda.com/home/Player.aspx?lpk4=54089
  http://www.lynda.com/home/Player.aspx?lpk4=54090

Topics/activities:
- Lab work: Digital capture of analog audio and video; metadata capture, use and output; use and comparison of various file formats and resolutions; Issues in digitization, migration and exchange. (3 hours 40 min.)

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Practice Lab: Monday, October 19 (top)
Topics/activities:
- Lab work: TBD activities

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Class 4: Wednesday, October 21 (top)

Due this class:
Read the following:

- Grammy Recording Academy Website. Producers and Engineers Wing. Read "Recommendation for Delivery of Recorded Music Projects 2008" **and** "Digital Audio Workstation Guidelines for Music Production — Full Version" http://www.grammy.com/Recording_Academy/Producers_And_Engineers/Guidelines/

- Apple, Inc. Final Cut Pro 6 Manual. Read Volume IV, Chapters 10 and 11 (PDF pages IV-129 through IV-161) - "Importing and Exporting EDLs" and "Using Final Cut Pro XML and Quicktime Metadata". Find manual on Blackboard.

- American Library Association, "Digital Rights Management and Libraries" on the web site of ALA. Accessed 9/3/09 at http://www.ala.org/ala/aboutala/offices/wo/woissues/copyrightb/digitalrights/digitalrightsmanagement.cfm

- Duncan, Charles et al. "Digital Rights Management: Final Report". JISC. 2004. Accessed 9/3/09 at http://www.intrallect.com/index.php/intrallect/knowledge_base/general_articles/jisc_drm_study_2004__1

Topics/activities:

- **Brian Hoffman** will lecture on the topic of digital workflows and the preservation lifecycle (12:30-2:10PM - 100 min.)

- **Grace Agnew** will lecture on digital rights management (DRM) – a technical overview and the implications to archives and libraries (2:30–4:10PM - 100 min.)

- Wrap up discussion, questions and comments (20 min.)

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Class 5: Wednesday, November 11 (top)

Due this class:
Read the following:
- Wilson, Andrew; Richard Wright; Malcolm Polfreman; Sheila Anderson; Simon Tanner; and Emma Beer. Only "Chapter 7: Moving Images and Sound Metadata Review and Requirements" in "Moving Images and Sound Archiving Study". Arts and Humanities Data Service. 2006. Accessed 9/3/09 at http://www.jisc.ac.uk/media/documents/programmes/preservation/moving%20pictures%20and%20sound%20archiving%20final%20version.doc

-    The National Information Standards Organization (NISO). "Framework of Guidance for Building Good Digital Collections". Version 3. 2007. Accessed 9/3/09 at http://framework.niso.org/node/5

- Gartner, Robert. "Metadata for Digital Libraries: State of the Art and Future Directions." JISC Standards and Technology Watch, Version 1.0, April 2008. Accessed 9/3/09 at http://www.jisc.ac.uk/media/documents/techwatch/tsw_0801pdf.pdf

- "METS: An Overview and Tutorial." Metadata Encoding and Transmission Standard Official Website. Accessed 9/3/09 at http://www.loc.gov/standards/mets/METSOverview.v2.html

- PBCore v1.1 User Guide. Accessed 9/3/09 at http://www.pbcore.org/PBCore/UserGuide.html

  View the following:
- Library of Congress. "Preserving Public Television" in the Library of Congress Webcasts. 2006. **Requires Real Player to be installed on your computer.** Accessed 9/3/09 at http://www.loc.gov/today/cyberlc/feature_wdesc.php?rec=3848

- Bradley, Kevin. "Defining Digital Sustainability". LIBRARY TRENDS, Vol. 56, No. 1, Summer 2007 ("Preserving Cultural Heritage," edited by Michèle V. Cloonan and Ross Harvey), pp. 148–163. 2007. The Board of Trustees, University of Illinois. Find on Blackboard site for class.

- Lavoie, Brian. "The Fifth Blackbird: Some Thoughts on Economically Sustainable Digital Preservation." 2008. *D-Lib Magazine*, 14,3/4 (March/April). Accessed 9/3/09 at www.dlib.org/dlib/march08/lavoie/03lavoie.html.

- Palm, Jonas. "The Digital Black Hole." 2006. Training for Audiovisual Preservation in Europe (TAPE). Accessed 9/3/09 at http://www.tape-online.net/docs/Palm_Black_Hole.pdf

- Moore, R.L., J. D'Aoust, R.H. McDonald, and D. Minor. "Disk and Tape Storage Cost Models." In: Proceedings of the IS&T Archiving Conference, p. 29 (2007). Accessed 9/3/09 at http://www.sdsc.edu/~mcdonald/content/papers/dt_cost.pdf

Topics/activities:
- Lab Work: Working with digital audio and video files, performing routine tasks of creating checksums, documentation and parsing of metadata for capture, exporting metadata, creating preservation object deliverables. (100 min)

- ***Kara Van Malssen*** will discuss her involvement with the NDIIPP project; Discuss the landscape of planning, implementing, maintaining and sustaining a repository, and identify the role of the moving image and sound archivist in that landscape. Kara will also provide concrete examples of metadata – taking a field by field look at a METS XML document. (2:30-4:30PM - 120 min)

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Class 6: Wednesday, November 25 (Assignment Due) (top)

Due this class:
- Final Draft of Assignment Due

Read the following:
- Wilson, Andrew; Richard Wright; Malcolm Polfreman; Sheila Anderson; Simon Tanner; and Emma Beer. Only "Chapter 8: Life Cycle and Organizational Models" in Moving Images and Sound Archiving Study. Arts and Humanities Data Service. 2006. Accessed 9/3/09 at http://www.jisc.ac.uk/whatwedo/programmes/programme_preservation/project_movingimagesound.aspx

- Jantz, Ronald, and Giarlo, Michael J. "Digital Preservation: Architecture and Technology for Trusted Digital Repositories". D-Lib Magazine, June 2005. Accessed 9/3/09 at http://www.dlib.org/dlib/june05/jantz/06jantz.html

- Farmer, Jacob "Storage Design for High Capacity and Long Term Storage". DLF Spring Forum, Raleigh, NC. May 6, 2009. Accessed 9/3/09 at http://www.diglib.org/forums/spring2009/presentations/Farmer.pdf

- "Trustworthy Repositories Audit & Certification: Criteria and Checklist (TRAC)", Version 1.0, Feb. 2007, Center for Research Libraries and RLG Programs (revised and expanded version of The Audit Checklist for the Certification of Trusted Digital Repositories, originally developed by RLG-NARA Digital Repository Certification Task

Force). Accessed 9/3/09 at
http://www.crl.edu/PDF/trac.pdf

Topics/activities:
* Discussion, questions and comments (15 min.)

* Storage media, architectures and structures; Trusted Digital Repositories; Estimating capacity and throughput (12:45 – 2:00PM - 75 min.)

* *David Rice* will lecture on his work developing and implementing asset management systems revolving around moving image and sound content. (2:20-3:50PM - 90 min.)

Review:
* AJA Data Rate Calculator:
    Mac OSX http://www.aja.com/ajashare/AJA_Data_Rate_Calculator_v2.app.tar
    Windows http://www.aja.com/ajashare/AJA_dataratecalculator_win_10-5.zip

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Plagiarism Advisory:
Plagiarism and other violations of the University's published policies are serious offenses and will be punished severely. Plagiarism includes presenting or paraphrasing a phrase, sentence, or passage of a published work (including material from the World-Wide Web) in a paper or exam answer without quotation marks and attribution of the source, submitting your own original work toward requirements in more than one class without the prior permission of the instructors, submitting a paper written by someone else, submitting as your own work any portion of a paper or research that you purchased from another person or commercial firm, and presenting in any other way the work, ideas, data, or words of someone else without attribution. These are punishable offenses whether intended or unintended (e.g., occurs through poor citations or confusion about how to reference properly).