

JPEG2000 for Archives and Libraries

ALA Annual Conference 2008
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Agenda

- Introduction to JPEG2000:
Portions of presentations by Dr. Robert Buckley and Justin Dávila
- “Lightning Talks”

Attribution

- This portion of the presentation is based on the "Digital Imaging with JPEG 2000: Access, Preservation and Interchange" presentation delivered by Dr. Robert Buckley, Research Fellow at Xerox Imaging & Services Technology Center, at ALA Annual Conference, Chicago, Illinois, on June 25, 2005.
- Content has been adapted with permission. Extracts of Dr. Buckley's presentation are not available for redistribution.

What is JPEG2000?

- Wavelet-based image-compression standard developed by the same ISO committee that previously developed JPEG
- Conceived as a next generation image compression standard that would:
 - ▶ improve on the performance of JPEG
 - ▶ add features and capabilities not available with baseline JPEG compression

JPEG 2000 Standard

ISO/IEC 15444 / ITU-T Rec.T.800

- Part 1: Core Coding System
- Part 2: Extensions
- Part 3: Motion JPEG2000
- Part 4: Conformance Testing
- Part 5: Reference Software
- Part 6: Compound Image File Format
- Part 8: JPSEC Secure JPEG2000
- Part 9: JPIP Interactivity Tools
- Part 10: JP3D3D & Floating Pt
- Part 11: JPWLWireless
- Part 12: ISO Media File Format (jointly developed with MPEG)
- Part 13: Entry-Level JPEG2000 Encoder (license and royalty fee free)

Xerox Slides

- Wavelet Transform
- Three-level Wavelet Transform
- Progressive by Resolution
- Progressive by Quality

JPEG2000 in Archives and Libraries Interest Group of the LITA Division of ALA.

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About Justin Dávila

- Justin Dávila is an independent, respected consulting authority in the areas of large-scale audiovisual digitization techniques and digital media technologies.
- Application development and database design for large, medium, and small collections.
- Mr. Dávila led projects for Yale University, the Library of Congress, and other clients, in the creation of an automated robotic videotape digitization system called SAMMA™, the System for the Automated Migration of Media Assets,

Topics in Compression in JPEG 2000

- “Visually” Lossless
- “Mathematically” Lossless

Mathematically Lossless

- Completely reversible
- Exactly the same data in and out
- Think .zip files.
- For JPEG2000, a roughly 2:1 or even 3:1 ratio of compression, based on content.

Visually Lossless

- JPEG 2000 offers significant improvements to JPEG2000.
- Visually lossless is an inherently subjective measure.

Projects

Dance Heritage Coalition

Library of Congress

National Coalition of Health/National Library of
Medicine

Sony 4k Digital Cinema Projects

Dance Heritage Coalition

- Dance Heritage Coalition report on JPEG2000 as a lossless audiovisual heritage preservation format.
- Justin Dávila served as technical lead on this 2004 report.
- [http://www.danceheritage.org/preservation/
Digital_Video_Preservation_Report.doc](http://www.danceheritage.org/preservation/Digital_Video_Preservation_Report.doc)
- Report showed potential for JPEG2000.

Library of Congress

- Using JPEG 2000 for an archival format in the National Audiovisual Conservation Center.
- Multi-stage process in converting to and from JPEG 2000.

National Coalition of Health/ National Library of Medicine

- Examined JPEG 2000 largely for still images where lossless resolution and compression were primary goals.
- Some interest in audiovisual moving media applications.

Sony 4k Digital Cinema Projects

- Digital Cinema Initiative (DCI)
- Spiderman3
 - distributed at 4k
 - used Digital Cinema packages
 - used JPEG2000 as codec

Lightning Talks

- Audience Participation!
- Five minutes per speaker
- Projects, reports, plans, products related to the use of JPEG2000 in the cultural heritage arena

Charles Olson's Melville Project

- JPEG2000 files with embedded metadata
- [http://charlesolson.uconn.edu/
Works_in_the_Collection/Melville_Project/](http://charlesolson.uconn.edu/Works_in_the_Collection/Melville_Project/)