



Archival Science, Digital Forensics and New Media Art

By

Dianne Dietrich and Frank Adelstein

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DFRWS is dedicated to the sharing of knowledge and ideas about digital forensics research. Ever since it organized the first open workshop devoted to digital forensics in 2001, DFRWS continues to bring academics and practitioners together in an informal environment. As a non-profit, volunteer organization, DFRWS sponsors technical working groups, annual conferences and challenges to help drive the direction of research and development.

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Digital Forensics, Archival Science, and New Media Art

Where Art Met Science or
The Search For Intent

DFRWS 2015: August 12, 2015
Dianne Dietrich Cornell University
Frank Adelstein Cayuga Networks

Introduction

- Frank
 - Background: Forensic R&D, Tools, Training, etc.
 - Interest in applying forensics to archival material
(hey, this doesn't involve crime!)
 - Joint paper to understand commonalities and points of divergence between two areas

Introduction

- Dianne
 - Technical lead on grant at Cornell University Library:
 - Analyze a collection of CD-ROM art from the ‘90s
 - Characterize it in enough detail to develop framework for access and preservation framework other institutions could use for similar collections
 - Parallels to forensics:
 - We too had incomplete information (about the artworks)
 - Couldn’t always get in touch with their creators and didn’t always know “exactly how” something *should* work



Preservation and Access Framework for Digital Art Objects

Test bed: 100 born-digital artworks
created for CD-ROM, 1990s-2000s



Includes: Standalone executable files, installed software,
3D landscapes, works run entirely in web browsers, etc.



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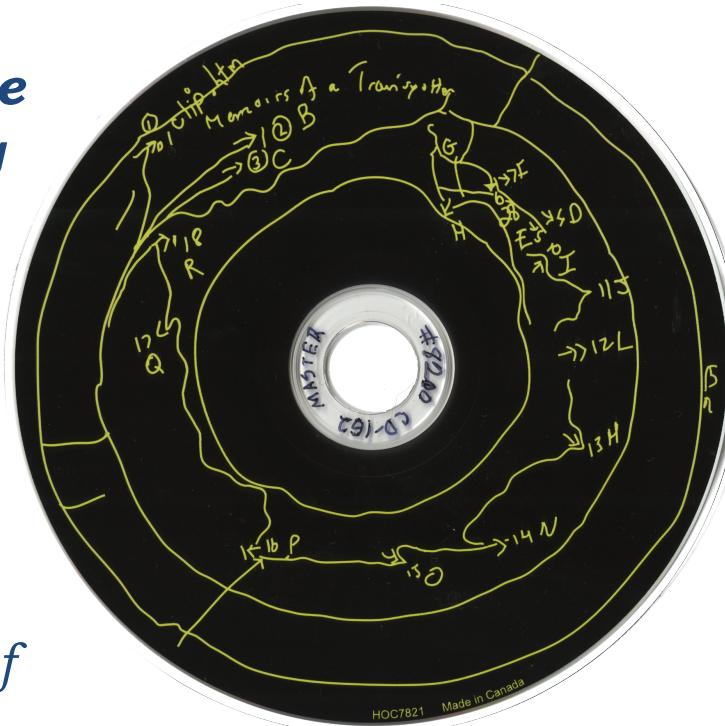


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Context and artistic intent are key

“I am worried about context and artistic intent – how do we retain authenticity in the long term?”

“Access to past works are incredibly valuable to me – understanding works not just for their message but also for their technical [aspects that] help new media artist[s] evolve [this] area of practice.”



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New media art is on obsolete hardware



“Macintosh System 7.0 and up”

“Internet connection and web browser with ... Shockwave”

“PowerPC processor-based Macintosh computer”

“Macintosh with 680x0 series processor”

“16 bit color and 13 inch monitor”

“QuickTime 2.1 or better”



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Example 1: Beyond Manzanar

- Immersive environment based on the Japanese-American internment camp at Manzanar
- Semi-transparent and fading images integral to the overall experience
- Needed to optimize graphics rendering in emulated environment
- Analysis needed to confirm we provided the best possible version of the experience



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Analysis clarifies limits of access



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Beyond Manzanar (2002)
Tamiko Thiel and Zara Houshmand

Analysis clarifies limits of access



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Beyond Manzanar (2002)
Tamiko Thiel and Zara Houshmand

Analysis clarifies limits of access



May the mountains witness.

williamson, whitney, Lone Pine, look:

To the West, a sea of strangers.

Each one wears my face.

Erase the shame, the fear, the witless hate,

witness now, too late:

Each stranger wears my fate.



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Beyond Manzanar (2002)
Tamiko Thiel and Zara Houshmand

Analysis clarifies limits of access

May the mountains witness.

williamson, Whitney, Lone P

To the West, a sea of

Each one wears my f

Erase the shame, the fear,

witness now, too late:

Each stranger wea

Let the earth feel:

To the East, a friend unfound yet.

Embrace the lover yet to be discovered.

Unmake the bed you've made; go free.

How like you is the other: simply see.



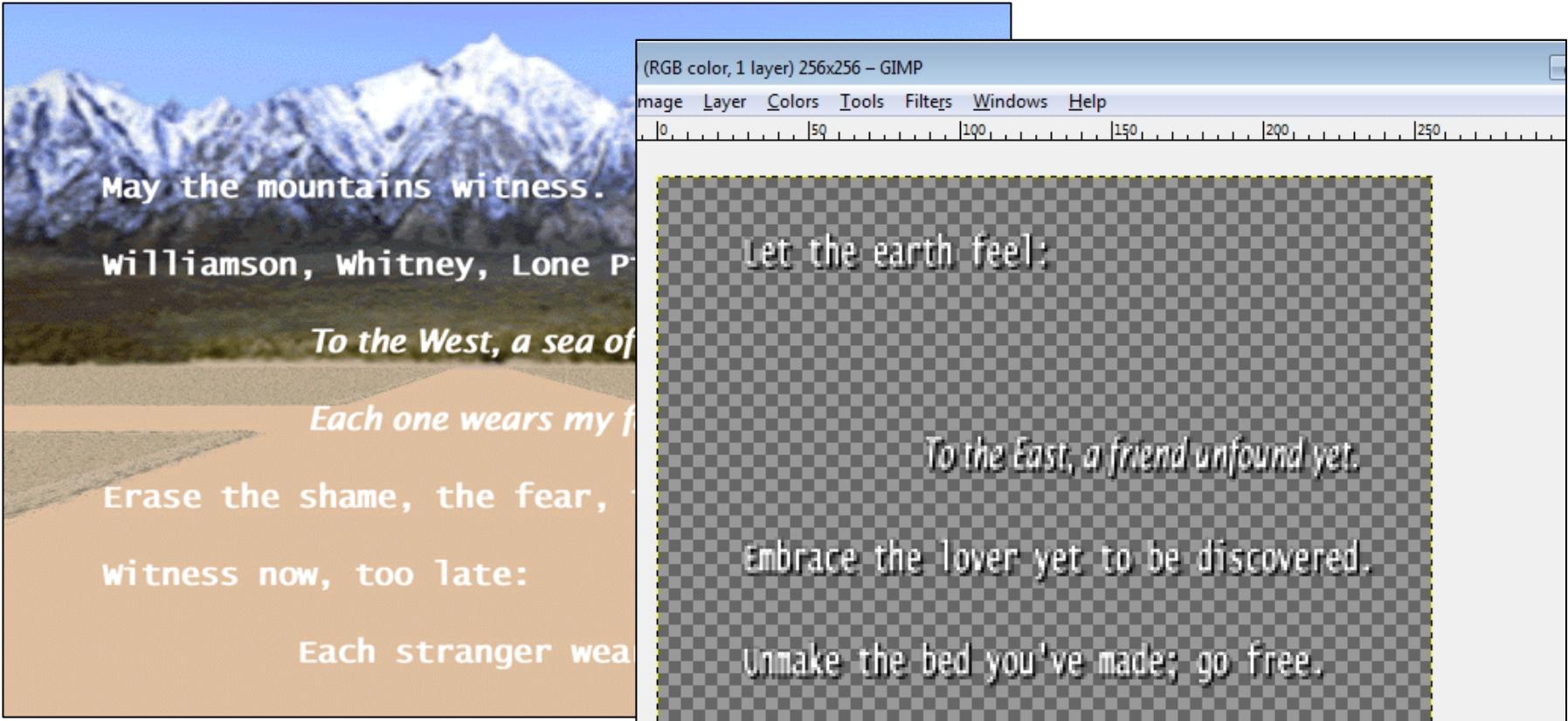
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Beyond Manzanar (2002)

Tamiko Thiel and Zara Houshmand

Example 2: Just from Cynthia

- Compilation of multiple works on a single CD-ROM
- Many mysteriously named files – seemingly unrelated to the actual artworks – present on disc
- File system metadata was insufficient to determine the purpose of the mystery files
- Running the work in an emulated system was required to understand their purpose



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Just from Cynthia (2001)
Albert Sorbelli

File metadata can't tell the whole story



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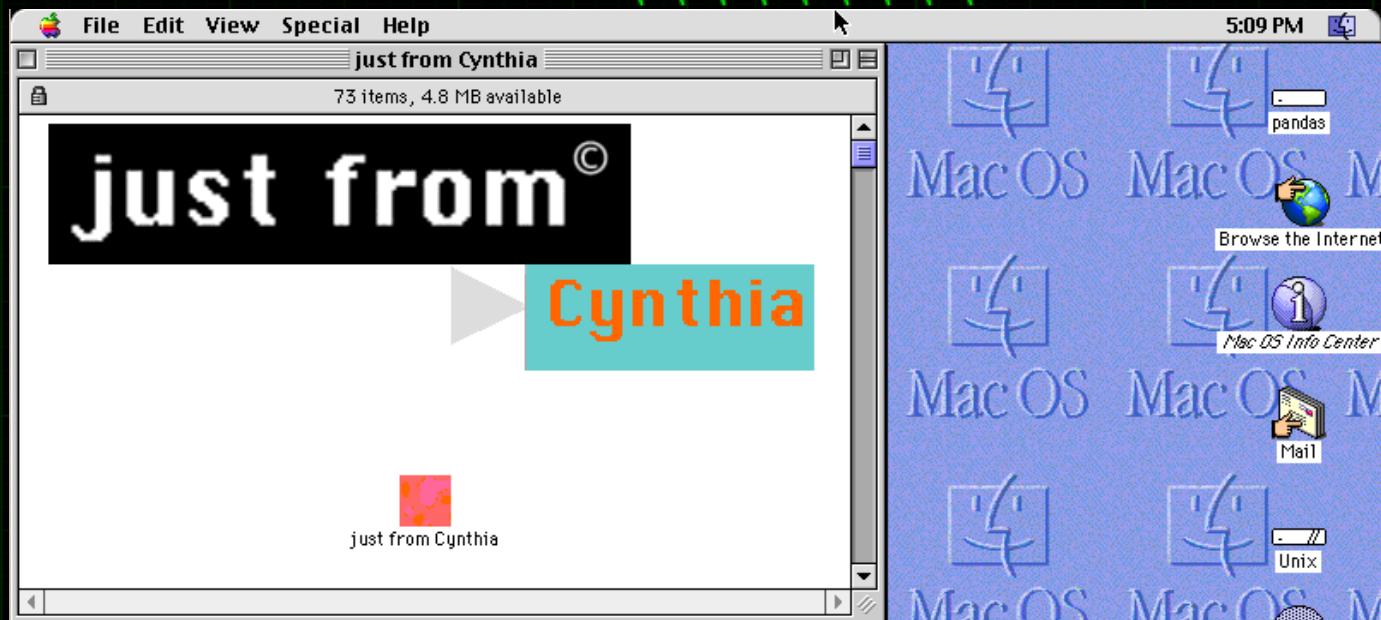
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Just from Cynthia (2001)
Albert Sorbelli

File metadata can't tell the whole story

```
bcadmin@ubuntu:/media/sdb1/datadrive/metadata_samples/tech_metadata$ hls -lbQ
f  ?????/???? 1694 0 Mar 19 1997 "\t\t\t\t\t\t\t\t\t\t\t\t\t\t"
f  ?????/????
```

```
f  ?????/????
```



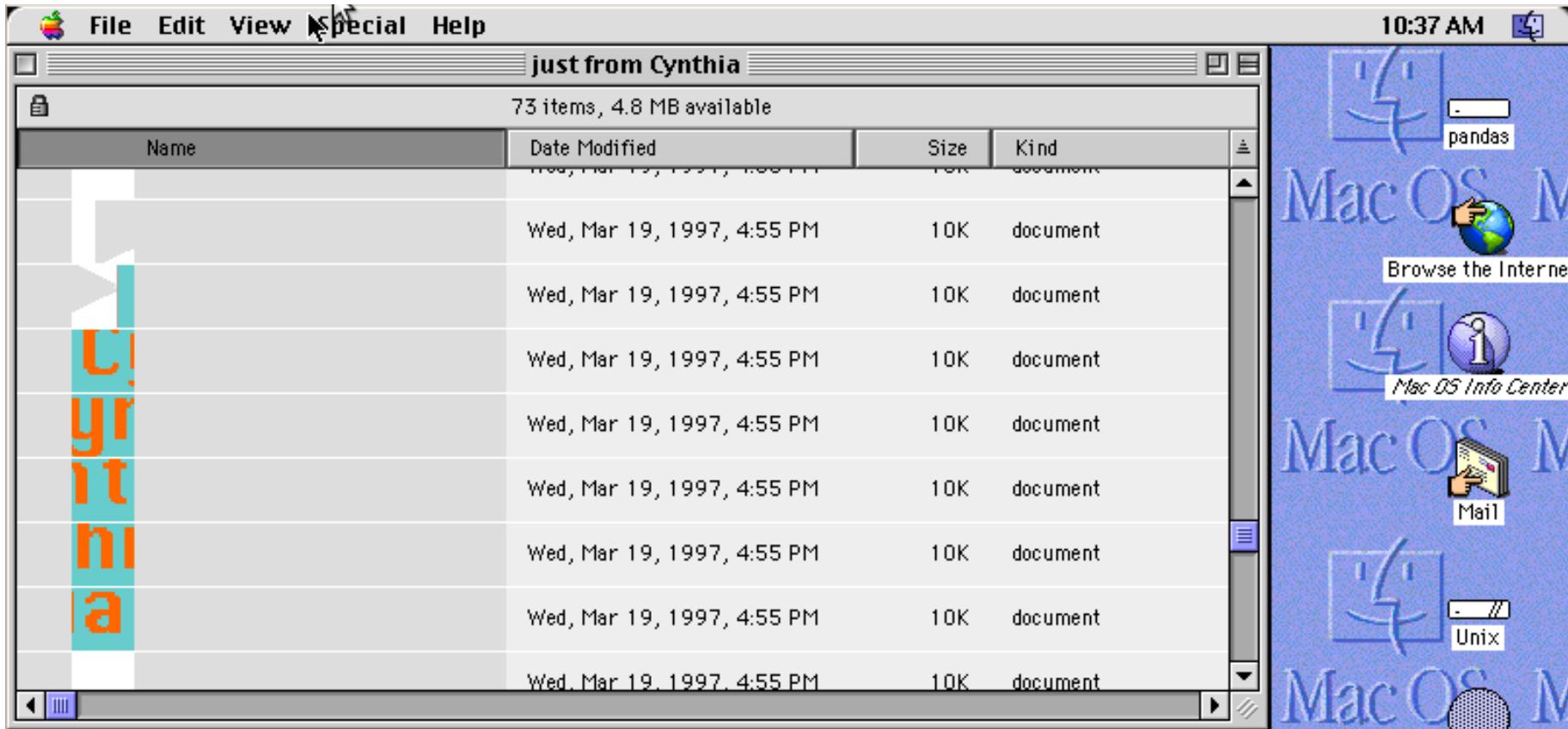
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Wrap up

- Intent
 - Sometimes archivists *must* alter data to preserve the *significant properties* of digital material
- The Past
 - Obsolete technology needs obsolete tools and arcane knowledge.
Don't lose it or assume it's no longer valuable!
- The Future
 - Scary words: cloud, mobile, ephemeral, distributed, ocean of data
 - How can highly interconnected, massive, moving data be frozen?
 - Emulation and virtualization are still imperfect access strategies
- Preserving data long term
 - “There is no preservation without loss.” – Matthew Kirschenbaum

Image credits (in order of appearance)

- Old Macs – Wikipedia; http://en.wikipedia.org/wiki/File:Macintosh_IIci.png (Public Domain) and http://en.wikipedia.org/wiki/File:Indigo_iMac_G3_slot_loading.jpg (CC By 2.0)
- “Welcome to Macintosh” Screen capture of System 7 in BasiliskII emulator (Dianne Dietrich)
- Windows 95 Desktop – Wikipedia;
http://en.wikipedia.org/wiki/File:Windows_95/Desktop_screenshot.png (Used with permission from Microsoft via Wikipedia)
- Creative Labs Soundblaster card – Wikipedia;
http://en.wikipedia.org/wiki/File:KL_Creative_Labs_Soundblaster_AWE64_Gold_CT4390.jpg (GPL)
- Beyond Manzanar by Tamiko Thiel and Zara Houshmand, reference image from
<http://www.mission-base.com/manzanar/screenshots.html> Source image (showing transparency and drop-shadow): from CD-ROM version of work in Goldsen collection.
- Just from Cynthia by Albert Sorbelli: File listings in Ubuntu and Mac OS 8 (Dianne Dietrich)

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