

# Mapping Digital Forensics Metadata to Preservation Events Using BitCurator

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**Abstract:** There is growing recognition that digital forensics approaches provide archivists with powerful tools for processing born-digital materials. Yet the ability to implement such approaches in born-digital workflows can prove daunting for archival institutions. Additional complexities and conceptual challenges arise when considering the disk image, an entity with multiple dependencies, as an archival object needing to be preserved. In this poster we describe how the BitCurator software environment, a suite of open-source digital forensic tools, can support the preservation goals of archivists throughout their institutional workflows. We propose four scenarios in which preservation events can be recorded during the creation and ingest of a disk image into an archival repository:

1. Imaging: extraction of the image from the media;
2. File system analysis: extraction of information from the file system(s)
3. Stream-based feature analysis: forensic analysis of the raw bitstream to identify features of interest;
4. Redaction: elimination of potentially private and sensitive data from a disk image or copy

We then demonstrate how the output of digital forensics tools incorporated into BitCurator can be mapped to PREMIS (PREservation Metadata: Implementation Strategies) encoded preservation events. For archival institutions working with born-digital materials, the capture and storage of preservation metadata helps to ensure authenticity, integrity, and provenance throughout the records continuum.

## About the authors:

*Alex Chassanoff* is a Ph.D. student at the School of Information and Library Science (SILS) at the University of North Carolina at Chapel Hill. Her research interests include the information behavior of digital archive users, digital materiality, and curation and preservation environments. Her current research looks at how historians use digitized photographs as evidence. Alex received her MSIS in 2009 and was a Digital Curation

Fellow at SILS from 2008-2009. Prior to graduate school, she worked as a database programmer, IT consultant, and digital asset manager.

**Kam Woods** is a Postdoctoral Research Associate in the School of Information and Library Science at the University of North Carolina at Chapel Hill. He is currently Technical Lead on the BitCurator project, and works with Dr. Cal Lee developing techniques and tools to assist in long-term archiving of born-digital data.

Kam's research focuses on long-term preservation of born-digital materials. He is interested in interdisciplinary approaches that combine technologies and expertise in the areas of archiving, computer science, and digital forensics for the purpose of enabling and maintaining access to digital objects that are at risk due to obsolescence. Prior to his current work at UNC, Kam worked with Cal Lee on the development of educational materials to support the use of realistic forensic datasets in professional training and to identify and explore novel uses of forensic data and tools in the context of digital archives.

**Christopher (Cal) Lee** is Associate Professor at the School of Information and Library Science at the University of North Carolina, Chapel Hill. He teaches courses on archival administration; records management; digital curation; understanding information technology for managing digital collections; and acquiring information from digital storage media. He is a lead organizer and instructor for the DigCCurr Professional Institute, a week-long continuing education workshop on digital curation, and he teaches professional workshops on the application of digital forensics methods and principles to digital acquisitions.

Cal's primary area of research is the long-term curation of digital collections. He is particularly interested in the professionalization of this work and the diffusion of existing tools and methods into professional practice. Cal developed "A Framework for Contextual Information in Digital Collections" (*Journal of Documentation*), and edited and provided several chapters to *I, Digital: Personal Collections in the Digital Era* published by the Society of American Archivists.

Cal is Principal Investigator of the BitCurator project, which is developing and disseminating open-source digital forensics tools for use by archivists and librarians. He was also Principal Investigator of the Digital Acquisition Learning Laboratory (DALL) project, which investigated and tested the incorporation of digital forensics tools and methods into digital curation education. Cal has served as Co-PI on several projects focused on preparing professionals for digital curation responsibilities: Preserving Access to Our Digital Future: Building an International Digital Curation Curriculum (DigCCurr),

DigCCurr II: Extending an International Digital Curation Curriculum to Doctoral Students and Practitioners; Educating Stewards of Public Information for the 21st Century (ESOPI-21), Educating Stewards of the Public Information Infrastructure (ESOPI2), and Closing the Digital Curation Gap (CDCG). In a project called Curation of a Forensic Data Collection for Education, Cal investigated and developed resources to enhance access and use of disk images to support digital forensics education.