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Biography:
Fenella G. France is Chief of the Preservation Research and Testing Division at the Library of Congress. She received her Ph.D from Otago University, New Zealand and researches advanced non-invasive spectral imaging of US "Top Treasures," including the Waldseemüller 1507 Map, the draft of the Declaration of Independence, and drafts of the Gettysburg address. An international specialist on polymer aging, Dr. France focuses on environmental damage to cultural objects. She was the research scientist for the Star-Spangled Banner project, preservation of World Trade Center artifacts, pre-Columbian mummies and textiles, Ellis Island Immigration Museum, and artifacts at other cultural heritage institutions.

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Biography:
Michael B. Toth, president of R.B. Toth Associates, brings over 25 years of experience with systems integration, program management and strategic planning to a range of new technology problems as museums, libraries and individuals seek to capitalize on advances in information and digital imaging technology. He has supported scientific and cultural institutions across the United States and Europe, and his work is cited in the book The Archimedes Codex. He has presented papers on program and information management, spectral imaging, information technology, and the application of international standards to cultural heritage studies, as well as two Google Techtalks.

Title:
Capturing, Documenting and Mapping the Digital Cultural Object

Abstract:
Advanced digital spectral imaging enables the ability to create accurate digital renderings of cultural heritage materials, generating a new "digital cultural object" with enhanced access to new previously unavailable information. Combining spectral information with oblique "raking" light offers additional data in the vertical spatial dimension. The recovery of lost, hidden and unknown non-invasive spectral information allows a depth of digital reconstruction – from 3D renderings of wood blocks, to details on feathers, fibers and other objects. The addition of additional vertical information with the available combination of spectral and spatial data offers potential to provide previously undiscovered information about cultural norms and changes in 3D objects, while protecting the original material. The ability to rapidly disseminate and access the range of digital data in this *object* engenders interaction with multidisciplinary collaborations between and across previously disparate fields. This must be addressed in any 3D system to enable viewers to access the data and metadata in useable form. These new technologies have a significant impact on

heritage research with the creation of a wealth of digital data that can be integrated for a range of preservation and scholarly interpretations. These data can often confound previously accepted knowledge and understanding of cultures, heritage construction techniques, and history.

Spectral imaging captures layers of information that add new dimensions to the heritage object, and with scriptospatial mapping, offers the potential to link scholarly and scientific data. This allows for a type of digital archaeology to reconstruct the past without disturbing the landscape of the object – a non-invasive non-contact tool for characterization of cultural heritage objects. The 3D digital data offer a balance between preservation and access, and in turn requires sustainability of the data, with efficient digital storage and preservation. Allowing unrestricted digital access to our past enhances the transfer of information to current generations, engages them in the past, and integrates multidisciplinary fields through non-destructive methods that allow access but ensure preservation.

Data management is a critical component for access, sharing and interpretation of this digital data and requires ongoing investments into technology and infrastructure. This becomes more complex with the addition of a 3d dimension of data in terms of the metadata that needs to be stored, standards for storage and viewing of the image, and long-term preservation of both. Effective management of these large scientific data sets offers significant potential for collaboration and advancement of cultural heritage between institutions through the continued development of advanced archiving, hosting and processing capabilities to ensure preservation of this digital data for future generations. This requires effective integration and management of spectral tools and 3D imaging systems to ensure ease of sharing of data based on common metadata, standards and technical applications for the studies of cultural heritage objects. The layers of data captured within these 3D digital objects must be integrally linked with the original cultural object, to ensure integration of cultural, scientific and sociological data and information that enhances the context and understanding of the cultural heritage object.