
3D digital documentation summit

10-12 July, 2012 Presidio of San Francisco

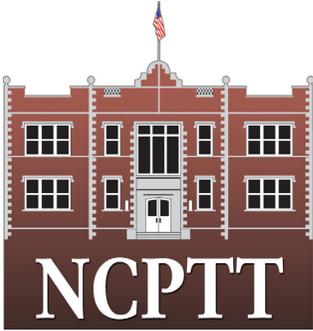


3D DIGITAL **DOCUMENTATION** FOR THE PRESERVATION OF CULTURAL HERITAGE



welcome	1
sponsors	2
keynote speaker	3
monday	5
tuesday	5
wednesday	7
thursday	9
venue	11
dining	11
transit	11
map	12

Welcome



The National Center for Preservation Technology and Training is an office of the National Park Service created by Act of Congress in 1992. NCPTT advances the application of science and technology to historic preservation. Working in the fields of archeology, architecture, historic landscapes, and materials conservation, the National Center accomplishes its mission through training, education, research, technology transfer and partnerships.

The recording of position, dimensions, and shape is a fundamental part of almost every project related to the preservation of cultural heritage, forming an integral element in the documentation and analysis process, and contributing to our understanding of buildings, objects, and sites. With the evolution and accessibility of new methods of three-dimensional measurement, computer software, and technology, there is a growing demand for three-dimensional digital information. While this form of documentation provides unique advantages over traditional methods, there are many questions about its limitations and suitability that remain to be answered.

NCPTT organized this summit in cooperation with the Presidio Trust and other National Park Service offices, including the Intermountain Regional Office, for the purposes of disseminating knowledge of the state of the art of 3D digital documentation within the field of cultural heritage. This summit also aims to foster debate over the issues that arise when digital formats are chosen in place of the traditional, or when faced with the storage and curation of data for future generations. The National Park Service also hopes to utilize this opportunity to spark discussions that will eventually lead to the establishment of goals and guidance for the use of 3D digital documentation at the sites it manages and beyond.

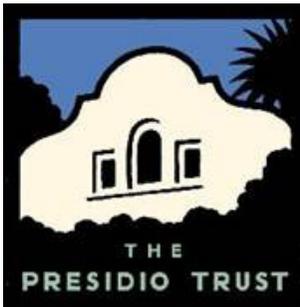
On behalf of the staff of NCPTT, I would like to welcome you to the Presidio and to this summit. I trust that you will enjoy the many great presentations that are in store and hope that you will find this to be a truly productive and edifying experience.

Kirk A. Cordell
Executive Director

Sponsors



The Friends of NCPTT is a 501(c)(3) incorporated in the State of Louisiana for the purpose of supporting the programs and projects of NCPTT. Since 1994, local and national parties interested in its programs have taken steps to support it. The Friends of NCPTT supports the Center through fundraising and sponsorship of activities. We are currently assisting in the delivery of training and research products.



The Presidio Trust was established by the United States Congress in 1996 to administer the Presidio of San Francisco, an urban national park site located at the base of the Golden Gate Bridge. The Presidio is one of the largest and most ambitious historic preservation projects underway in the United States. The Presidio's historic buildings represent the nation's most comprehensive collection of military architecture, dating from the Civil War through the Cold War, including homes and barracks that reflect how the military social hierarchy and domestic life evolved in the Presidio. Since 1994, approximately 75 percent of the park's historic structures have been rehabilitated for new uses. The park comprises nearly 6 million square feet of buildings, including 469 historic structures that contribute to the Presidio's status as a National Historic Landmark District.

ROCKET SCIENCE AND 3D ANALYSES IN THE PRESERVATION OF ARTISTIC AND HISTORIC WORKS

More than sixty years ago, development began on the nuclear-propelled ORION Spaceship destined for a manned mission to the planet Saturn. This Defense Department program encompassed laser simulation of nuclear ablation as well as 3D holographic imaging of rocket exhaust plasmas and ultrasonic shockwaves within the space vehicle. After the cancellation of the Orion Space Program, portions of the remaining experimental and theoretical capability found their way to Venice, Italy, in support of the UNESCO effort to save the "Queen of the Adriatic" from the Aqua Alta threat.

In 1972 this international project revealed the feasibility of 3D holographic recording of Venetian monuments, holographic interferometric and ultrasonic diagnoses of artwork interiors, laser divestment and consolidation of deteriorating artwork surfaces, and several art diagnostic procedures such as Digital Image Processing, inside-out MRI, and x-ray CT scanning. In subsequent decades these technologies have been embraced by the preservation and conservation communities resulting in the founding of a number of specialized professional societies.

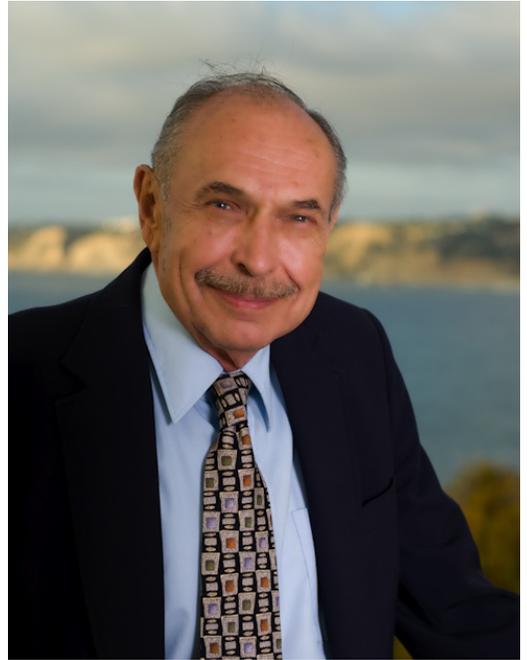
Dr. Asmus' presentation will describe projects involving such scientific tools for the conservation of sculpture in Italy, image restoration of the "Mona Lisa", recovery of Qin-Dynasty terra cotta warrior polychrome, cleaning of the Buddha thumb, and restoration of The San Francisco Art Institute's "Beat Culture" icon ("The Rose") by Jay De-

Feo. The photon divestment technique was selected to restore the Parthenon for the 2004 Olympic Games and is now being employed to restore Egyptian murals.

John F. Asmus is on the Research Faculty of the Department of Physics at the University of California, San Diego. He earned his PhD. From the California Institute of Technology and is the co-founder of the Center for Art/Science Studies at UCSD. In 1990 he was awarded the Rolex Laureate for Enterprise (Polychrome Recovery Of The Qin-Dynasty Terra Cotta Warriors) and became a Fellow of the Explorers Club. He has published 150 articles in professional journals in the fields of lasers, laser applications, photoacoustic spectroscopy, digital image processing, ultrasonic imaging, holography, holographic interferometry, plasma pinch technology, and hypervelocity impact phenomenology. He is the author of 25 patents.

In the decade of the 1960s he was employed by General Atomic Corporation and contributed to the ORION Space Ship, CASABA-HOWITZER, and High-Altitude EMP Programs. In 1967 he became Laser Department Director. During the 1970s he was a Research Staff Member of the Institute for Defense Analyses where he organized and directed studies for DARPA, DDR&E, and JASON on high-energy lasers, Soviet laser technology, chemical and gas-dynamic lasers, high-energy-laser propagation, and the National Laser Laboratory Proposal of the US Presidential Science Advisor.

Over the past forty years, Dr. Asmus has led



the art conservation field in the use of 3D holography, lasers, ultrasonics, and digital image processing. He has applied these tools to the problems of divestment, analysis, interpretation, and presentation associated with diverse art conservation activities as well as lunar imaging programs at CALSPACE. He has also been instrumental in the founding of professional art conservation and laser societies. He is a member of UNESCO and EU conservation and preservation commissions on World Heritage Sites including the Parthenon restoration program. He is the Honorary President of the LACONA professional society and is on editorial boards for Springer, Wiley, and Elsevier.

Monday

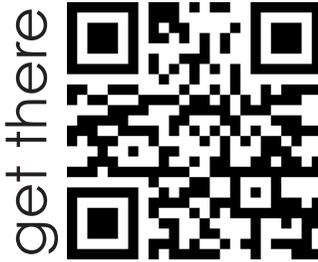
07.09.2012

05:00-06:30p
pre-registration

06:00-07:30p
mixer at the transit center café

Join us on for a mixer at the Transit Center Café! Summit goers receive one free drink (additional drinks and food will be on your own) courtesy of the **Western Chapter of Association for Preservation Technology (WCAPT)** and **Leica Geosystems, Inc.**

Transit Center Café
37.80181, -122.45619
215 Lincoln Blvd
San Francisco, CA 94129



Tuesday

07.10.2012

08:00
registration

08:30
introductions and welcome

09:00
keynote address

John F. Asmus, PhD, Institute for Pure and Applied Physical Sciences, Department of Physics, University of California, San Diego, La Jolla, CA

10:00
break

10:20
documenting national and world heritage sites: the need to integrate digital documentation and 3d scanning with traditional hand measuring techniques

Krupali Krusche, Assistant Professor and Principal Investigator for D.H.A.R.M.A., School of Architecture, University of Notre Dame, Notre Dame, IN

10:40
designing the lidar mission for industrial heritage: cooperation across the fields

Mark Dice, Master of Science Student, and **Tim Goddard**, PhD Candidate, Industrial Heritage and Archaeology, Department of Social Sciences, Michigan Technological University, Houghton, MI

11:00
evolution in project workflow – is high definition survey the missing link?
Brandon C. Friske, Quinn Evans Architects, Ann Arbor, MI

11:20

best practices for digital documentation

Ekaterini Vlahos, Associate Professor of Architecture and Director, and **Mike Nulty**, Technical Coordinator, Center of Preservation Research (CoPR), College of Architecture and Planning, University of Colorado Denver, Denver, CO

11:40

questions

12:00p

lunch

01:40p

monitoring using laser scanning – case study of watts towers

Christopher Gray, Mollenhauer Group, Los Angeles, CA

02:00p

3d scanning of matisse, the back i-iv: one thing after another

Lynda Zycherman, Conservator of Sculpture, Museum of Modern Art, New York, NY; **Harry Abramson**, Project Manager, **Joe Nicoli**, Heritage Scanning Specialist, and **Glenn Woodburn**, Technical Project Manager, Direct Dimensions, Inc, Owings Mills, MD

02:20p

3d digital documentation as a basis for the finite element method in the restoration of tullio lombardo's marble sculpture of adam

Ronald Street, The Metropolitan Museum of Art, New York, NY

02:40p

3d technology and the h.l. hunley: beyond documentation

Christopher Watters and **Michael Scafuri**, Clem-

son University Restoration Institute, Warren Lasch Conservation Center, North Charleston, SC; **Benjamin Rennison** and **Vincent Blouin**, Clemson University, Department of Architecture/Materials Science and Engineering, Clemson, SC

3:00p

questions

3:20p

break

03:40p

**PANEL DISCUSSION
presidio palimpsest**

moderated by **Michael Ashley**, Chief Technology Officer, Center for Digital Archaeology (CoDA), University of California, Berkeley, Berkeley, CA; sponsored by the **Western Chapter of Association for Preservation Technology (WCAPT)**

05:00p

end

Don't let this paper weigh you down! Get the digital version.

download



Wednesday

07.11.2012

08:00
registration

08:30
3d modeling of a gravestone exploiting low cost range and image based techniques

Dante Abate, Research Fellow, Technical Unit on Informatics Systems Development and ICT, ENEA Research Centre, Bologna, Italy

08:50
restoring the lions' roar: documenting and replicating limestone structures through laser scanning, 3d computer modeling, and cnc machining

Caitlin Smith, Project Manager, and **T. Scott Krellick**, Principal Conservator, Krellick Conservation LLC, Oreland, PA; **Harry Abramson**, Project Manager, and **Glenn Woodburn**, Technical Project Manager, Direct Dimensions, Inc, Owings Mills, MD; **Jon Lasch**, President, Digital Atelier, LLC, Mercerville, NJ

09:10
the patternmaker's art: innovation within a timeless tradition

J. Scott Howell, Vice President and General Manager, Robinson Iron, Alexander City, AL

09:30
foamhenge: 3d modeling and conservation of a monumental sculpture

B. Story Swett, Regional Chief Architect, Public Buildings Service, General Services Administration, Auburn, WA

09:50
questions

10:10
break

10:30
a comparative study using lidar digital scanning and photogrammetry

Mike Nulty, Technical Coordinator, **Neffra Matthews**, Geographer, and **Tom Noble**, Center of Preservation Research (CoPR), College of Architecture and Planning, University of Colorado Denver, Denver, CO

10:50
high resolution digital photogrammetry with object surface texture

Battle Brown, Senior Research Scientist, Carnegie Mellon University, Pittsburgh, PA

11:10
close range photogrammetry vs. 3d scanning for archaeological documentation

Katie Simon, Archaeological Remote Sensing Specialist, and **Rachel Opitz**, Research Associate, Center for Advanced Spatial Technologies, University of Arkansas, Fayetteville, AR

11:30
capturing, document and mapping the digital cultural object using spectral imaging

Fenella G. France, Chief, Preservation Research and Testing Division, Library of Congress, Washington, DC and **Michael B. Toth**, President, R.B Toth Associates, Oakton, VA

11:50
questions

12:10p
lunch

01:30p
POSTER SESSION

color and spectral archiving using dual-rgb

imaging

Roy S. Berns and Jim Coddington

integrating aerial and ground-based lidar in appalachian heritage planning and visualization

Peter Butler and Paul Kinder

saving the lines: documenting ships and small craft using laser scanning technology

Todd Croteau

3d digital documentation of cultural resources in southern arizona national parks

Jake Degayner

utilizing digital methods to document and reconstruct old sheldon church

Chad Keller

recording structure and process: haer 3d digital documentation methods

Meremy Mauro

3d data recordation and immersive visualization: considerations for creative mitigation practices

Marshall R. Millett

mortaring the gaps: the need to supplement laser scan data in habs documentation projects

Daniel De Sousa

laser scanning america's cultural landscapes, the historic american landscapes survey (hals): documentation to the secretary of the interior standards, assessing the value of laser scan data

Christopher Stevens and Dana Lockett

post-processing workflows: identifying hidden costs in converting scan data to useable information

John Wachtel

cooperation creates a custom crate: conservation, laser scanning, 3d milling and

crate building work together

Lynda Zycherman and Steven K. O'Banion

03:00p

four light total appearance imaging of paintings

Roy S. Berns, Richard S. Hunter Professor in Color Science, Appearance, and Technology, Director of the Munsell Color Science Laboratory, and **Tongbo Chen**, Postdoctoral Fellow, Munsell Color Science Laboratory, Rochester Institute of Technology, Rochester, NY; **Jim Coddington**, Agnes Gund Chief Conservator, Conservation Department, Museum of Modern Art, New York, NY

03:20p

automated classification of surface texture for photographic paper

Richard Johnson, Geoffrey S. M. Hedrick Senior Professor of Engineering, School of Electrical and Computer Engineering, Cornell University, Ithaca, NY; **Paul Messier**, conservator of photographs in private practice, Boston, MA

03:40p

break

04:00p

advances in computational photograph techniques for cultural, historic, and natural history materials

Carla Schroer, Director, **Mark Mudge**, President, and **Marlin Lum**, Imaging Director, Cultural Heritage Imaging, San Francisco, CA

04:20p

application of current 3d and pseudo-3d imaging for conservators

Melvin J. Wachowiak, Senior Conservator, and **Elizabeth Keats Webb**, Imaging Specialist, Museum Conservation Institute, Smithsonian Institution, Washington, DC

Thursday

07.12.2012

04:40p

applications of reflectance transformation imaging (rti) in a fine arts museum: examination, documentation, and beyond

Philip A. Klausmeyer, Conservation Department, Worcester Art Museum, Worcester, MA

05:00p

conservation and h-rti at the metropolitan museum of art

Ashira Loike and **Anna Serotta**, Sherman Fairchild Center for Objects Conservation, The Metropolitan Museum of Art, New York, NY

05:20p

end

08:30

why digital? its only 1's and 0's

Robert Warden, Professor of Architecture and Director of the Center for Heritage Conservation, Texas A&M University, College Station, TX

08:50

documentation to the secretary of interiors standards: assessing the value of laser scan data

Dana Lockett, Architectural Project Manager, and **Paul Davidson**, Project Architect, Heritage Documentation Programs, National Park Service, Washington, DC

09:10

archive of digital data for habs, haer, and hals

Anne Mason, Collections Manager, Heritage Documentation Programs, National Park Service, Washington, DC

09:30

questions

10:00

break

10:20

PANEL DISCUSSION
digital data management

moderated by **Elizabeth Lee**, Director of Operations, CyArk, Oakland, CA; sponsored by **CyArk**

11:40

lunch

12:40p

DEMONSTRATION SESSIONS

(see chart)

	Group A 	Group B 	Group C 	Group D 
12:40p	Documentation In Situ	RTI and AR	Digital Dissemination	ScanStation C10
01:40p	RTI and AR	Digital Dissemination	ScanStation C10	Documentation In Situ
02:40p	Digital Dissemination	ScanStation C10	Documentation In Situ	RTI and AR
03:40p	ScanStation C10	Documentation In Situ	RTI and AR	Digital Dissemination

documentation in situ: the example of the deanza room in the officers club at the presidio

As part of a rehabilitation project that began in mid-2011, the walls and roof of the deAnza Room at the Officers Club were systematically assessed for condition, and repaired and stabilized as necessary. Participants will see the room as it is going through its final transformation, and view several of the products delivered from the extensive digital and traditional documentation projects that were conducted as part of the rehabilitation. Presented by Michael Ashley and sponsored by the Presidio Trust, Center for Digital Archaeology, and WCAPT. **(Location: Officer's Club)**

reflectance transformation imaging (rti) and algorithmic rendering (ar)

This session will demonstrate the capture of a photographic sequence to be used for RTI and/or AR using off the shelf DSLR camera equipment. It will also provide an overview of the software pipeline for working with images and producing and analysing RTIs. Presented by Mark Mudge, Carla Schroer, and Marlin Lum from Cultural Heritage Imaging. **(Location: Archaeology Lab)**

scanstation c10

This session will include a demonstration of the Leica ScanStation C10, a compact, all-in-one scanning platform. Participants will cover: field setup, data collection & registration; data cleanup & maintenance, deliverable creation methods, and Cyclone Software Best practices. Presented by Joshua Vandiver, Regional Manager for Leica Geosystems. **(Location: Golden Gate Club)**

digital dissemination

Digital documentation creates a wealth of new media. During this session, CyArk will demonstrate how this new media can be leveraged to share the stories of the site, explain the documentation process, and build advocacy for future preservation efforts. Presented by Elizabeth Lee, Director of Operations at CyArk. **(Location: Golden Gate Club)**

04:40p
break

05:00 nps issue identification session

Kirk Cordell, Executive Director, National Center for Preservation Technology and Training, National Park Service, Natchitoches, LA

06:30p
event ends

Venue



Golden Gate Club

37.80035, -122.46152

135 Fisher Loop
San Francisco, CA 94129

(415) 561-5444



Dining

Acre Cafe 1013 Torney Ave, Ste B-120 (415) 561-2273

Beach Hut Cafe 1199 E Beach (415) 561-7761

Dixie 1 Letterman Dr (415) 829-3363

Kitchen 39 39 Mesa St, Bldg 3 (415) 561-2336

Presidio Bowling Center 93 Moraga Avenue (415) 561-2695

Presidio Cafe 300 Finley Rd (415) 561-4600

Presidio Social Club 563 Ruger St (415) 885-1888

Starbucks 1 Letterman Dr (415) 441-1740

Transit Café at the Presidio 215 Lincoln Blvd (415) 561-4435

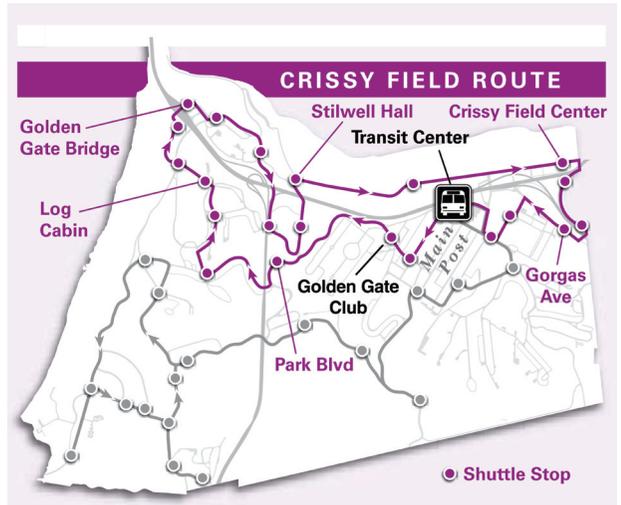
Walt Disney Family Museum 104 Montgomery St (415) 345-6800

Warming Hut 983 Marine Dr & Long Ave (415) 561-3040

PresidiGo Shuttle

The Golden Gate Club is served by the **PresidiGo AROUND THE PARK** Shuttle, Crissy Field Route. Shuttles are free within the park.

live bus map





National Park Service
U.S. Department of the Interior

National Center for Preservation Technology and Training
645 University Parkway
Natchitoches, LA 71457