

2012 18th International Conference on Virtual Systems and Multimedia

(VSMM 2012)

**Milan, Italy
2 – 5 September 2012**



**IEEE Catalog Number: CFP12137-PRT
ISBN: 978-1-4673-2564-6**

Table of Contents

Full papers

Session F1 – Virtual Museums

Visitor’s Evaluation. Digital Restitution and Public Communications. A Touring Exhibition: The North Church of Bawit Monastery (Egypt) <i>Sahar Ghaderi and Olivier Bouet</i>	3
In the Mirror of the Wonder of Luca Giordano. Multisensory Experience Itinerary with Impact Assessment at Palazzo Medici Riccardi (Florence, Italy) <i>Perla Gianni Falvo</i>	11
Temporary Made Permanent Turning Temporary Exhibitions into Fixed Memories <i>Giorgia Morlando, Luca Lamera and Gabriele Guidi</i>	19
Archeovirtual 2011: An Evaluation Approach to Virtual Museums <i>Sofia Pescarin, Alfonsina Pagano, Mattias Wallergard, Wim Hupperetz and Christie Ray</i>	25

Session F2 – Historical research through virtual models

A Virtual Reconstruction Approach for Archaeoastronomical Research <i>Georg Zotti and Wolfgang Neubauer</i>	33
Virtual Models as a Means of Research in History of Technique <i>Davide Russo, Alexander Neuwahl and Andrea Bernardoni</i>	41
The Digital Hadrian’s Villa Project. Using Virtual Worlds to Control Suspected Solar Alignments <i>Bernard Frischer and John Fillwalk</i>	49
Surveying, Analysis and 3D Modeling in Archaeological Virtual Reconstruction The Inner Colonnade of the Naos of Temple G of Selinunte <i>Federico Maria Giammusso</i>	57

Session F3 - Multimodal Environments

Multimodal Navigation within Multilayer-modeled Gregorian Chant Information <i>Adriano Baratè, Goffredo Haus, Luca Andrea Ludovico and Damiano Triglione</i>	65
A Multisensory VR System Exploring the Ultra-Reality <i>Yasushi Ikei, Koji Abe, Koichi Hirota and Tomohiro Amemiya</i>	71

Skillful Manipulation of Virtual Objects.	79
Implementation of Juggling in a Virtual Environment <i>Minato Mizutori, Koichi Hirota and Yasushi Ikei</i>	
Chinese Culture Approached Through Touch	87
Chinese Cultural Heritage Learnt via Touch-based Games <i>Li Wang and Erik Champion</i>	
Session F4 - Mobile Augmented Reality	
Efficient 3D Content Authoring Framework based on Mobile AR	95
<i>Sang-Wook Lee, Jinki Jung, Jihye Hong, Suwon Lee, Hyunwoo Cho and Hyun S. Yang</i>	
Revealing the “Spirit of the Place”.	103
Genius Loci, A Spatial Augmented Reality Performance based on 3D Data and Historical Hypotheses <i>Aur�lie Favre-Brun, Livio De Luca, Christian Jacquemin and V�ronique Caye</i>	
Cultural Heritage and Mobile Technologies	109
Towards a Design Framework <i>Davide Spallazzo</i>	
An "Augmented" Experiences in Cultural Heritage Through Mobile Devices: "Matera Tales of a City" Project	117
<i>Eva Pietroni</i>	
Enhancing Integration of Virtual Objects in Augmented Reality Applications	125
<i>Mohamed El Zayat, Selma Rizvic and Vedad Hulusic</i>	
Session F5 - Virtual GIS	
An Ecosystem of Tools and Methods for Archaeological Research	133
<i>Susanna Bortolotto, Giovanna Bagnasco Gianni, Stefano Valtolina, Piero Favino, Andrea Garzulino, Matilde Marzullo, Raffaella Simonelli and Barbara Rita Barricelli.</i>	
Shedding Light on the City: Discovering, Appreciating and Sharing Cultural Heritage using 3D Visual Technology	141
<i>Elena Ippoliti, Alessandra Meschini, Annika Moscati, Daniele Rossi and Livio De Luca</i>	
Exploring Object Representations	149
Virtual Reality Models for Environmental Planning Projects <i>Ilona Heldal and Mattias Roupe</i>	
Photogrammetry for Medieval Archaeology	157
A Way to Represent and Analyse Stratigraphy <i>Pierre Drap, Djamal Merad, Jean-Marc Boi, Julien Seinturier, Daniela Peloso, Christophe Reidinger, Guido Vannini, Michele Nucciotti and Elisa Pruno</i>	
A Database of Spatialized and Semantically-Enriched Iconographic Sources for the Documentation of Cultural Heritage Buildings	165
<i>Chiara Stefani, Chawee Busayarat, Julie Lombardo and Livio De Luca</i>	

Session F6 - 3D capture of Underwater Cultural Heritage

- Documentation of a Submerged Monument using Improved Two Media Technique 173
Andreas Georgopoulos and Panagiotis Agrafiotis
- Multi-view 3D Reconstruction of Small Stone Samples Deteriorated by Marine Organisms 181
Alessandro Gallo, Fabio Bruno, Maurizio Muzzupappa and Mauro F. La Russa
- Underwater Image Preprocessing for Automated Photogrammetry in High Turbidity Water. 189
An Application on the Arles-Rhone XIII Roman Wreck in the Rhodano River, France
Amine Mahiddine, Julien Seinturier, Daniela Peloso, Jean-Marc Boi, Pierre Drap, Djamal Merad and Luc Long

Session F7 - Gesture based interaction

- Point Clouds Indexing in Real Time Motion Capture 195
Dario Mazzanti, Victor Zappi, Andrea Brogni and Darwin Caldwell
- Analysis of Human Gestures in the 3D Space to Control Multimedia Interfaces 203
Marco Soave and Raffaele de Amicis
- Interactive Exploration of Historic Information via Gesture Recognition 211
Sam Bailey, Chris Powell, Stephen Laycock and Andy Day

Session F8 – Digital Repositories and diachronic analysis

- A Scalable Repository Infrastructure for CH Digital Object Management 219
Xueming Pan, Thomas Schiffer, Martin Hecher, Martin Schrottner, Sven Havemann, Renè Berndt and Dieter Fellner
- 3D in the CARARE Project. 427
Providing Europeana with 3D Content for the Archaeological and Architectural Heritage:
the Pompeii Case Study
Maria Emilia Masci, Annamaria De Santis, Kate Fernie and Daniel Pletinckx
- GNSS/INS Aided Precise Re-photographing 235
Erica Nocerino, Fabio Menna and Fabio Remondino
- How to Preserve Inspirational Environments that Once Surrounded a Poet? 243
Immersive 360° Video and the Cultural Memory of Charles Causley's Poetry
Karol Kwiatek

Session F9 - 2D/3D Image Processing

- Improving on Fast and Automatic Texture Mapping of 3D Dense Models 251
Anna Pelagotti, Francesca Uccheddu and Pasquale Ferrara
- 3D Virtual Reconstructions of Artworks by a Multi-view Scanning Process 259
Sandro Barone, Alessandro Paoli and Armando V. Razionale
- A Modular Framework for Deformation and Fracture using GPU Shaders 267
Derek John Morris, Eike Falk Anderson and Christopher Peters

Archaeological Fragment Characterization and 3D Reconstruction based on Projective GPU Depth Maps	275
<i>Carlos Sánchez Belenguer and Eduardo Vendrell Vidal</i>	
Session F10 - Interaction with Virtual Heritage	
A Serious Heritage Game for Art History: Design and Evaluation of ThIATRO	283
<i>Josef Froschauer, Max Arends, Doron Goldfarb and Dieter Merkl</i>	
Brain-Controlled Serious Games for Cultural Heritage	291
<i>Athanasios Vourvopoulos, Fotis Liarokapis and Panagiotis Petridis</i>	
Digital Display Case to Convey Dynamic Mechanisms of Exhibits	299
<i>Ryo Kiyama, Takashi Kajinami, Masamichi Ueta, Takuji Narumi, Tomohiro Tanikawa and Michitaka Hirose</i>	
Schema Migration into a Web-based Framework for Generating Virtual Museums and Laboratories	307
<i>Daniel Biella, Wolfram Luther and Daniel Sacher</i>	
Session F11 - Collaborative research and embodiment	
The Fort Ross Virtual Warehouse Project: a Serious Game for Research and Education	315
<i>Maurizio Forte, Nicola Lercari, Llonel Onsurez, Justine Issavi and Elizabeth Prather</i>	
A Novel Gesture-based Interface for a VR Simulation: Re-discovering Vrouw Maria	323
<i>Ferhat Şen, Lily Díaz and Tommi Horttana</i>	
Kinect and 3D GIS in Archaeology	331
<i>Heather Richards-Rissetto, Jim Robertsson, Fabio Remondino, Giorgio Agugiaro, Gabrio Girardi and Jennifer von Schwerin</i>	
Natural Interaction in VR Environments for Cultural Heritage and its Impact Inside Museums: the Etruscanning Project	339
<i>Eva Pietroni, Claudio Rufa, Daniel Pletinckx, Iefke Van Kampen and Christie Ray</i>	
Enabling Virtual Assembly Training in and Beyond the Automotive Industry	347
<i>André Stork, Neyir Sevilmis, Daniel Weber, Dominic Gorecky, Christian Stahl, Matthias Loskyll and Frank Michel</i>	
Session F12 – From range data to CAD reconstructions and BIMs	
As-built BIM with Shades Modeling for Energy Analysis	353
<i>Lucía Díaz-Vilariño, Susana Lagüela, Julia Armesto and Pedro Arias</i>	
A Virtual Connection Between Past and Present: the Digital Revival of Cham's Architecture (Vietnam)	361
<i>Gabriele Guidi, Michele Russo, Davide Anghelèddu and Patrizia Zolese</i>	

Integration of Historic Building Information Modelling (HBIM) and 3D GIS for Recording and Managing Cultural Heritage Sites <i>Conor Dore and Maurice Murphy</i>	369
4 Years History: from 2D to BIM for CH. The Main Spire on Milan Cathedral <i>Cristiana Achille, Francesco Fassi and Luigi Fregonese</i>	377
The Reconstruction of the “Fontana di Sala Grande” and Some Hypothesis About its Original Layout <i>Giorgio Verdiani, Giacomo Pirazzoli and Giada Cerri</i>	383
 Session F13 – 3D Visualization	
Building Multi-platform 3D Virtual Museum Exhibitions with Flex-VR <i>Jakub Flotyński, Jacek Dalkowski and Krzysztof Walczak</i>	391
Remote Rendering and Visualization of Large Textured 3D Models <i>Dante Abate, Belén Jiménez Fenández-Palacios, Silvio Migliori, Samuele Pierattini, Fabio Remondino and Alessandro Rizzi</i>	399
From Point Cloud to Web 3D Through CityGML <i>Iñaki Prieto, Jose Luis Izkara and Francisco Javier Delgado Del Hoyo</i>	405
Browsing in the Virtual Museum of the Sarcophagi in the Basilica of St. Silvestro at the Catacombs of Priscilla in Rome <i>Laura Pecchioli, Fawzi Mohamed, Mirco Pucci and Barbara Mazzei</i>	413
 Session F14 – Biomedical Applications of VR	
3D Maxillofacial Model Creation for Computer-guided Treatments in Oral Rehabilitation <i>Sandro Barone, Alessandro Paoli and Armando V. Razionale</i>	421
Design and Evaluation of an Advanced Virtual Reality System for Visualization of Dentistry Structures <i>Diego Roberto Colombo Dias, José Remo Ferreira Brega, Luis Carlos Trevelin, Mário Popolin Neto, Bruno Barberi Gnecco and Marcelo de Paiva Guimarães</i>	429
Virtual Reality Simulation Training and Assisted Surgery: AYRA. Virtual and Physical Biomodels in Surgery <i>Cristina Suárez Mejías, Gorka Gómez Ciriza, Purificación Gacto Sánchez, Tomás Gómez Cía and Carlos Parra Calderon</i>	437
A CAD-based Methodology for Dental Implant Surgery <i>Alessandro Paoli and Armando V. Razionale</i>	445
 Session F15 - Knowledge Management	
Supporting Valorization of Cultural Heritage Documentation: The TIVal Portal Approach <i>Marco P. Locatelli, Davide Rinaldi, Carla Simone and Giuseppe Vizzari</i>	453

H-KNOW: Advanced Infrastructure for Knowledge based Services for Buildings Restoring <i>Aitziber Egusquiza and Jose Luis Izkara</i>	461
PATHS: Personalising Access to Cultural Heritage Spaces <i>Kate Fernie, Mark Stevenson, Paul Clough, Paula Goodale, Mark Hall, Phil Archer, Andrea de Polo, Runar Bergheim, Jillian Griffiths, Konstantinos Chandrinou, Eneko Agirre and Oier Lopez de Lacalle</i>	469
Toward a Methodology for 3D Content Models: the Reconstruction of Ancient Vaults for the Investigation of Maintenance Conditions and Structures Stability <i>Daniela Oreni, Raffaella Brumana and Branka Cuca</i>	475
 Session F16 - Virtual documentation of Cultural Heritage	
The Use of Low-Cost Technologies for the Promotion of Cultural Heritage Sites. The Case Study of Veleia <i>Anna Maria Manferdini</i>	483
The TIVAL Project: Integrating Multidisciplinary Perspectives <i>Carla Simone, Susanna Bortolotto, Gabriele Guidi, Goffredo Haus, Marco Malagodi, Marco Martini, Maria Teresa Mazzilli, Marco Morandotti and Pasquale Tucci</i>	491
Digital Cartographic Heritage in Service to the Society: Landscape Analysis for Informed Decision Making <i>Branka Cuca, Daniela Oreni and Raffaella Brumana</i>	499
From Surveying to Representation. Theoretical Background, Practical Issues, Possible Guidelines <i>Carlo Bianchini, Francesco Borgogni, Alfonso Ippolito, Luca James Senatore, Eliana Capiato, Chiara Capocefalo and Francesco Cosentino</i>	507

Short papers

Session S1 – Virtual documentation & 3D repositories

- 3D-ICONS: World Heritage Sites for Europeana 517
Making Complex 3D Models Available to Everyone
Andrea D'Andrea, Franco Nicolucci, Sheena Bassett and Kate Fernie
- Terrestrial Laser Scanning (LiDAR) as a Means of Digital Documentation in Rescue Archaeology. 521
Two Examples from the Faynan of Jordan
Ashley Richter, Falko Kuester, Thomas Levy and Mohammad Najjar
- Computer Graphics for Building Archaeology. 525
An Interdisciplinary Approach for Conservation of Brazilian Cultural Assets
Regina Andrade Tirello and Pedro Murilo Gonçalves De Freitas
- Virtual Archive of Temporary Exhibitions: 529
New Scenarios for the Documentation, Storage and Fruition of an “Ephemeral Memory”
Alessandra Spagnoli
- New Semantic Media and 3D Architectural Models Representation 533
Luigi Valentino Losciale, Julie Lombardo and Livio De Luca

Session S2 – Multimodal & Immersive Environments

- Proposal of a Design Tool for Tactile Graphics with Thermal Sensation 537
Takahiro Kobayashi and Mika Fukumori
- Responsive Open Space. 541
Sound and Image in Public Spaces
Melanie Gau, Andrea Redi, Martin Kampel and Ivan Redi
- Color Preference of the Malay Population in the Design of a Virtual Environment 545
Zahari Taha, Hartomo Soewardi and Siti Zawiah Md Dawal
- Psynteraction Chair: 549
A Proposal of a System for Induction of Interpersonal Behavior by using Comic Book Images
as Ambient Information
Sho Sakurai, Shigeo Yoshida, Takuji Narumi, Tomohiro Tanikawa and Michitaka Hirose
- An Integrated Low-Cost System for At-Home Rehabilitation 553
Nunzio Alberto Borghese, Renato Mainetti, Michele Pirovano and Pier Luca Lanzi

Session S3 - Virtual exhibition

- The Use of Digital Media in a New Urban History Exhibition. 557
STAM – Ghent City Museum
Lars De Jaegher, Maria De Waele and Véronique Van Goethem
- MUZZEUM - Augmented Reality and QR Codes Enabled Mobile Platform with Digital Library 561
Used to Guerrilla Open the National Museum of Serbia
Vitomir Jevremovic and Sara Petrovski
- Maya Island Virtual Museum. 565
A Virtual Learning Environment, Museum, and Library Exhibit
Valerie Hill and Stylianos Mystakidis
- Recording and Superimposing Visitors in a Museum for Sharing Exhibition Experiences 569
Totaro Nakashima, Toshiki Takeuchi, Kunihiko Nishimura, Takuji Narumi, Tomohiro Tanikawa and Michitaka Hirose
- HistOracle: Consolidation and Dissemination of Heritage Information 573
Chris Powell, Stephen Laycock, Andy Day, Janka Rodziewicz, Jon Gregory, Tom Williamson and Sam Bailey

Session S4 - 2D/3D Image Processing

- Word Detection Applied to Images of Ancient Roman Coins 577
Albert Kavelar, Sebastian Zambanini and Martin Kampel
- Reliving Video Experience with Mobile Devices 581
Takuya Arakawa, Kazuhiro Kasada, Takuji Narumi, Tomohiro Tanikawa and Michitaka Hirose
- Volume Computation of The Monument of Queen Khentkawess 585
Ichiroh Kanaya, Yoshihiro Yasumuro, Sayaka Shigetomi, Aiko Yoshikawa, Hiroshige Dan, Masahiko Fuyuki, Yukinori Kawae and Hiroyuki Kamei
- An Automated and Accurate Procedure for Texture Mapping from Images 591
Mattia Previtali, Luigi Barazzetti and Marco Scaioni
- Automatic Detection of Discontinuities from 3D Point Clouds for the Stability Analysis of Jointed Rock Masses 595
Silverio García-Cortes, Celestino Ordóñez, Ramón Argüelles-Fraga and Agustín Menéndez-Díaz
- Low Cost Photogrammetry for Morphometric Human Detection in Video Surveillance 599
Paolo Russo, Alessio Furini and Emanuela Gualdi

Session S5 – Serious Games and Digital Art

- Reverence in Ravine: 603
A Transparent Sculpture in Coordinate Space on an Installation Art
Daichi Misawa

A Virtual Museum for Flemish Artworks. A Digital Reconstruction of Genoese Collections <i>Ilaria Angeloni, Federica Bisio, Alessandro De Gloria, Daniele Mori, Carlotta Capurro and Lauro Magnani</i>	607
Collecting, Sharing, Reusing Geo and Time-variant 3d Models of the City of Bologna An Open Project <i>Antonella Guidazzoli, Maria Chiara Liguori and Mauro Felicori</i>	611
A Novel Approach for Tourism and Education Through Virtual Vitoria-Gasteiz in the 16th Century <i>Ainhoa Perez-Valle and Diego Sagasti</i>	615
The Development of an Interactive Virtual Scenography for the Opera A Menina da Gotinha de Água by Miguel Azguime <i>André V. Perrotta and Luis G. Martins</i>	619
 Session S6 – 3D imaging methodologies in Cultural Heritage	
Game Engine for Cultural Heritage. New Opportunities in the Relation Between Simplified Models and Database <i>Alessandro Merlo, Luca Dalcò and Filippo Fantini</i>	623
Kcanvas: An Application for Creative Personal Knowledge Management <i>Akiko Takahashi, Christa Sommerer and Katsumi Tanaka</i>	629
3D Scanning Documentation of Two Different Objects – the King’s Chinese Cabinet in Wilanow Palace Museum and a Roman Gravestone from Archeological Excavations in Moesia Inferior as a Part of Multidisciplinary Research <i>Eryk Bunsch, Anna Guzowska and Robert Sitnik</i>	633
Integrated Methodology for Urban Survey and Representation of the Morocco’s High Atlas Earth Architecture <i>Pablo Rodriguez-Navarro, Filippo Fantini and Teresa Gil Piqueras</i>	637
Survey and Virtual Restoration The Castle of Magacela (Spain) <i>Salvatore Barba, Emanuela De Feo, Saverio D’Auria and Luigi Guerriero</i>	641
Demo Paper: Virtual Immersion Experience for Cultural Heritage Sites <i>Steve Cutchin, Adel Saad, Alyn Rockwood, Steve Smith, Neil G. Smith and Thomas E. Levy</i>	647