POLITECNICO DI TORINO
Repository ISTITUZIONALE

3D digital modelling as a method for the reconstruction of the historical image of the city: the case of piazza Bodoni in Turin (Italy) at the end of nineteenth century

Original
3D digital modelling as a method for the reconstruction of the historical image of the city: the case of piazza Bodoni in Turin (Italy) at the end of nineteenth century / Spallone, Roberta. - In: INTERNATIONAL ARCHIVES OF THE PHOTOGRAMMETRY, REMOTE SENSING AND SPATIAL INFORMATION SCIENCES. - ISSN 1682-1750. - STAMPA. - XXXVI-5/C53:(2007), pp. 680-684.

Availability:
This version is available at: 11583/2573151 since: 2018-09-21T15:10:55Z

Publisher:
ISPRS

Published
DOI:

Terms of use:

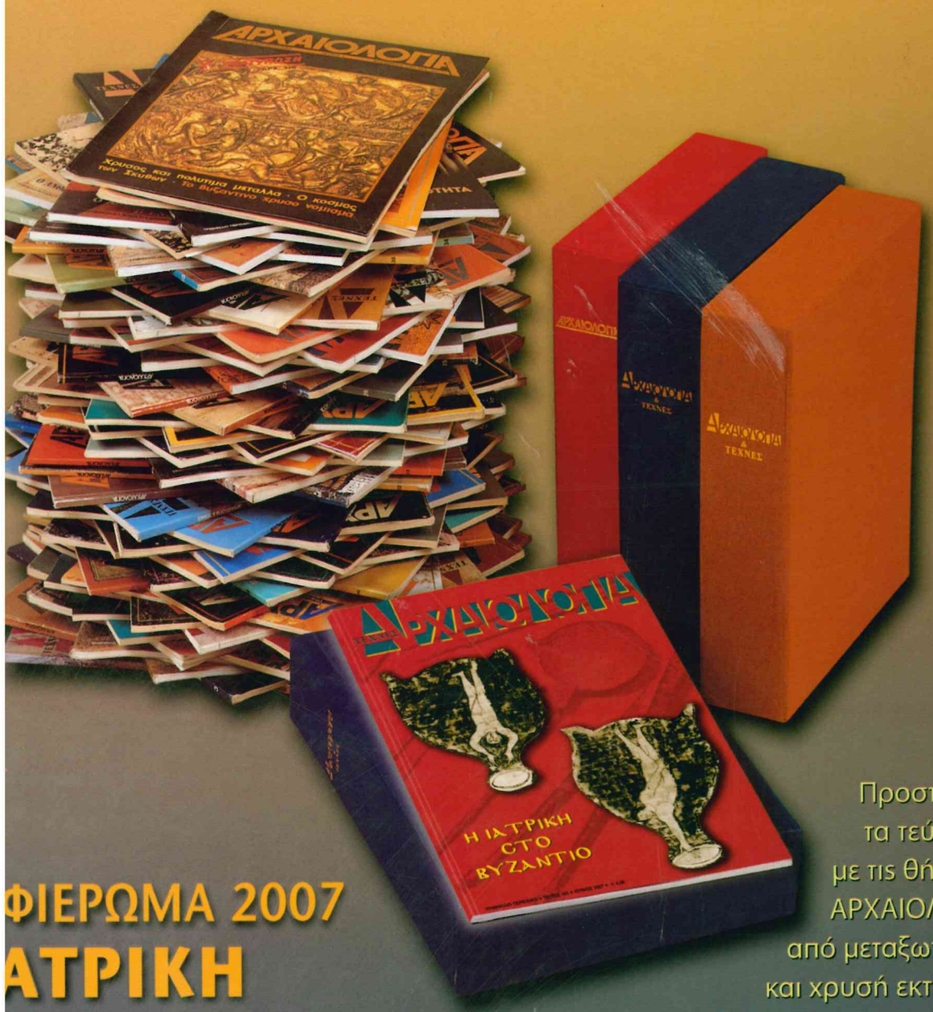
This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

24 April 2024

ΡΙΣΤΕ ΤΗΝ ΕΛΛΑΔΑ
ΑΡΧΑΙΟΛΟΓΙΑ, ΤΗΝ ΤΕΧΝΗ ΚΑΙ ΤΟΝ ΠΟΛΙΤΙΣΜΟ ΤΗΣ



ΦΙΕΡΩΜΑ 2007
ΑΤΡΙΚΗ

Προστατέψτε
τα τεύχη σας
με τις θήκες της
ΑΡΧΑΙΟΛΟΓΙΑΣ
από μεταξωτό πανί
και χρυσή εκτύπωση

26 Χρόνια
Περιοδικό ΑΡΧΑΙΟΛΟΓΙΑ & ΤΕΧΝΕΣ

103 ΤΕΥΧΗ

ΕΣΗ ΣΤΑ ΚΕΝΤΡΙΚΑ ΒΙΒΛΙΟΠΩΛΕΙΑ, ΣΤΑ ΠΕΡΙΠΤΕΡΑ ΚΑΙ ΣΤΑ ΠΡΑΚΤΟΡΕΙΑ ΤΥΠΟΥ ΣΕ ΟΛΗ ΤΗΝ ΕΛΛΑΔΑ
ΕΙΣ ΤΕΥΧΩΝ: Χρ. Λαδά 1. ΣΥΝΔΡΟΜΕΣ: Μιχαλακοπούλου 80, 115 28 Αθήνα, Τηλ.: 211 3659767, E-mail: syndrom@dolnet.gr

The ICOMOS & ISPRS Committee for Documentation of Cultural Heritage CIPA 2007 XXI International Symposium

CIPA Heritage Documentation

The ICOMOS & ISPRS Committee for Documentation of Cultural Heritage
CIPA 2007
XXI International Symposium

The ISPRS International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences
Volume XXXVI-5/C53
ISSN 1682-1750

The CIPA International Archives for Documentation of Cultural Heritage
Volume XXI-2007
ISSN 0256-1840

International Council on Monuments and Sites
Conseil International des Monuments et des Sites
ΤΕΕ
ΥΠΠΟ
isprs
International Society for Photogrammetry and Remote Sensing

The ICOMOS & ISPRS Committee for Documentation of Cultural Heritage
CIPA 2007
XXI International Symposium

Proceedings of the

XXI International Symposium

CIPA 2007

AntiCIPAting the future of the cultural past

Zappeion Megaron
Athens, Greece
01 – 06 October 2007

Volume 1

Published by the CIPA 2007 Organizing Committee

Editor-in-Chief
Prof. Andreas Georgopoulos

THE INTERNATIONAL ARCHIVES OF PHOTOGRAMMETRY, REMOTE SENSING AND SPATIAL INFORMATION SCIENCES
INTERNATIONALES ARCHIV FÜR PHOTOGRAMMETRIE, FERNERKUNDUNG UND RAUMBEZOGENE INFORMATIONSWISSENSCHAFTEN
ARCHIVES INTERNATIONAL DES SCIENCES DE LA PHOTOGRAMMÈTRIE, DE LA TÈLÈDÈTECTION ET DE L' INFORMATION SPATIALE
VOLUME XXXVI-5/C53

The ICOMOS & ISPRS Committee for Documentation of Cultural Heritage
CIPA 2007
XXI International Symposium

Proceedings of the

XXI International Symposium

CIPA 2007

AntiCIPAting the future of the cultural past

Zappeion Megaron
Athens, Greece
01 – 06 October 2007

Volume 1

Published by the CIPA 2007 Organizing Committee

Editor-in-Chief
Prof. Andreas Georgopoulos

THE INTERNATIONAL ARCHIVES OF PHOTOGRAMMETRY, REMOTE SENSING AND SPATIAL INFORMATION SCIENCES
INTERNATIONALES ARCHIV FÜR PHOTOGRAMMETRIE, FERNERKUNDUNG UND RAUMBEZOGENE INFORMATIONSWISSENSCHAFTEN
ARCHIVES INTERNATIONAL DES SCIENCES DE LA PHOTOGRAMMÈTRIE, DE LA TÈLÈDÈTECTION ET DE L' INFORMATION SPATIALE
VOLUME XXXVI-5/C53

Copies of this volume are available from:

- CIPA 2007 Organizing Committee
  Laboratory of Photogrammetry
  School of Rural & Surveying Engineering
  National Technical University of Athens
  9, Iroon Polytechniou
  GR-15780 Athens, Greece

  tel: +30210-7722675
  fax: +30210-7722677
  e-mail: drag@central.ntua.gr

- UNESCO – ICOMOS Documentation Centre
  49-51 rue de la Fédération
  F-75015 Paris, France

  tel: +33 1 45 67 67 70
  fax: +33 1 45 66 06 22
  e-mail: centre-doc-icomos@unesco.org

- CIPA Treasurer
  Prof. Pierre Grussenmeyer
  National Institute of Applied Sciences in Strasbourg
  Photogrammetry & Geomatics Group
  24, Boulevard de la Victoire
  F-67084 Strasbourg, France

  tel/fax: +33 3 88 14 47 33
  e-mail: Pierre.Grussenmeyer@insa-strasbourg.fr

ISSN: 1682-1750

Printed in Greece by the National Technical University of Athens printing unit

Copyright © 2007 by CIPA – The ICOMOS/ISPRS Committee for Documentation of Cultural Heritage

All rights reserved. Reproduction of this volume or any parts thereof, excluding short quotations for the use in preparation reviews and technical and scientific papers, may be made only by specific approval of the editor. Copyright od each individual paper resides with the author(s). The editor is not responsible for any opinions or statements made in the technical papers, nor can be held responsible for any typing or conversion errors.

CIPA 2007 SYMPOSIUM COMMITTEES

Scientific Committee

A. Georgopoulos, Prof. NTUA - ISPRS - Symposium Director
N. Agriantonis, Architect – Pres. ICOMOS Hellas

S. Avgerinou-Kolonia, Prof. NTUA - ICOMOS
D. Balodimos, Prof. NTUA - ISPRS
N. Charkiolakis, Ministry of Culture - ICOMOS
O. Georgoula – Prof. AUTh - ISPRS
Ch. Ioannidis, Prof. NTUA - ISPRS
G. Karras, Prof. NTUA - ISPRS
E. Korres, Prof. NTUA - ICOMOS
K. Mylonas, Prof. NTUA - ICOMOS
V. Palantzas, Architect - ICOMOS Hellas
P. Patias - Prof. AUTh - CIPA President
E. Petsa - Prof. TEI-A - ISPRS
C. Potsiou - Lecturer NTUA - ISPRS
E. Stylianidis – ICOMOS Cyprus
V. Tsioukas – Prof. DUT – ISPRS

Organizing Committee

A. Georgopoulos, Prof. NTUA - Symposium Director
N. Agriantonis Architect, ICOMOS Hellas

O. Georgoula, Prof. AUTh
Ch. Ioannidis, Prof. NTUA
E. Kalisperakis, NTUA
G. Karras, Prof. NTUA
G. Makris, NTUA
D. Mavromati, NTUA
V. Palantzas, ICOMOS Hellas
P. Patias - Prof. AUTh, CIPA President
S. Soile, NTUA
Efs. Stambouloglou, NTUA
E. Stylianidis, ICOMOS Cyprus
S. Tapinaki, NTUA
V. Tsioukas, Prof. DUT
A. Valanis, NTUA

Triaena TOURS & CONGRESS S.A.

Organizing Secretariat
Georgia Kateriniou, Evie Pappa, Efi Papastavropoulou
Triaena Tours & Congress S.A.
15, Mesogion Ave, 115 26 Athens-Greece

National Technical University of Athens

Under the Auspices of

Ministry of Culture

Hellenic ICOMOS

Acropolis Monuments Conservation Service

Πανελλήνιος Σύλλογος Διπλωματούχων Αγρονόμων και Τοπογράφων Μηχανικών

Hellenic Association of Rural & Surveying Engineers

Technical Chamber of Greece

CIPA 2007 SYMPOSIUM COMMITTEES

Scientific Committee

A. Georgopoulos, Prof. NTUA - ISPRS - Symposium Director
N. Agriantonis, Architect – Pres. ICOMOS Hellas

S. Avgerinou-Kolonia, Prof. NTUA - ICOMOS
D. Balodimos, Prof. NTUA - ISPRS
N. Charkiolakis, Ministry of Culture - ICOMOS
O. Georgoula – Prof. AUTh - ISPRS
Ch. Ioannidis, Prof. NTUA - ISPRS
G. Karras, Prof. NTUA - ISPRS
E. Korres, Prof. NTUA - ICOMOS
K. Mylonas, Prof. NTUA - ICOMOS
V. Palantzas, Architect - ICOMOS Hellas
P. Patias - Prof. AUTh - CIPA President
E. Petsa - Prof. TEI-A - ISPRS
C. Potsiou - Lecturer NTUA - ISPRS
E. Stylianidis – ICOMOS Cyprus
V. Tsioukas – Prof. DUT – ISPRS

Organizing Committee

A. Georgopoulos, Prof. NTUA - Symposium Director
N. Agriantonis Architect, ICOMOS Hellas

O. Georgoula, Prof. AUTh
Ch. Ioannidis, Prof. NTUA
E. Kalisperakis, NTUA
G. Karras, Prof. NTUA
G. Makris, NTUA
D. Mavromati, NTUA
V. Palantzas, ICOMOS Hellas
P. Patias - Prof. AUTh, CIPA President
S. Soile, NTUA
Efs. Stambouloglou, NTUA
E. Stylianidis, ICOMOS Cyprus
S. Tapinaki, NTUA
V. Tsioukas, Prof. DUT
A. Valanis, NTUA

Organizing Secretariat

Georgia Kateriniou, Evie Pappa, Efi Papastavropoulou
Triaena Tours & Congress S.A.
15, Mesogion Ave, 115 26 Athens-Greece

Under the Auspices of

National Technical University of Athens

Ministry of Culture

Hellenic ICOMOS

Acropolis Monuments Conservation Service

Hellenic Association of Rural & Surveying Engineers

Technical Chamber of Greece

CONTENTS

Tuesday 02.10.2007

page

Session 1
Innovative photogrammetric techniques

Digital Presentation, Documentation and Analysis of Paintings, Monuments and Large Cultural Heritage with Infrared Technology, Digital Cameras and Range Sensors, Rizzi A., Voltolini F., Girardi S., Gonzo L., Remondino F., **ITALY** 631

Fisheye Lens Camera System Application to Cultural Heritage Data Acquisition, Kedzierski M., Walvzykowski P., **POLAND** 809

The Solid Image Web Viewer: A New Way For 3D Survey Data Web-Fruition, Agosto E., Picco I., Rinaudo F., **ITALY** 23

Stereo-Panoramas: Problems and Solutions, Varshosaz M., Amini, **IRAN** 733

The Multi-Image Spherical Panoramas as a Tool for Architectural Survey, Fangi G., **ITALY** 311

Session 2
Documentation and Archaeology

Documentation and Analysis of Archaeological Sites Using Aerial Reconnaissance and Airborne Laser Scanning, Doneus M., Briese C., Fera M., Fornwagner U., Griebl M.,Janner M.,Zingerle M-C., **AUSTRIA** 275

Mapping Traditional Belief Systems and Establishing Contemporary Connections In An Ancient Cultural Landscape, Kasiannan S., **AUSTRALIA** 803

The Frozen Tombs of the Altai Mountains Inventarisation and Conservation, Goossens R., De Wulf A.,Bourgeois J., Gheyle W., Van Bever B., Vanommeslaeghe M., Dossche D., Devriendt D., **BELGIUM** 346

The Governance of Identity. Recording Values of Rural Heritage in Urban Areas, Agostini S., Cairoli , **ITALY** 764

Poster Session 1 – Photogrammetric Applications & e-Technology

3D-Modeling of the Brazilian Antarctic Station Comandante Ferraz - A Visualization With Animation, Erwes H. J.B., Prado W.S., Fazan J.A., Fonseca E.S.Jr., **BRAZIL** 297

New Trends in Digital Photogrammetry Teaching and Diffusion: The Z-GLIF Software, Menci L., Rinaudo F., **ITALY** 487

Use of Historical Images for the Documentation and the Metrical Study of Cultural Heritage by Means of Digital Photogrammetric Techniques, Bitelli G., Girelli A., Marziali M., Zanutta A., **ITALY** 141

The Integrated Survey for the Knowledge and the Documentation of the Archaeological Heritage: The "Villa Dei Misteri" in Pompei, Canciani M., Maestri D., Spadafora G., **ITALY** 193

To Teach Drawing in the University Degree In "Preservation and Restoration of Cultural Heritage" of University of Studies of Turin, in Venaria Reale (Italy), Spallone R., **ITALY** 685

Visible and Thermal IR Documentation of a Masonry Brickwork Building, Lerma J. L., Mileto C., Vegas F., Cabrelles M., **SPAIN** 456

Evaluation of Shape Capture as a Heritage Documentation and Monitoring Tool, Ouimet C., Robertson G., **CANADA** 553

Three-Dimensional Risk Mapping for Anti-Disaster Recording of Historic Buildings, Santana-Quintero M., Van Genechten B., **BELGIUM** 659

Data Gathering in Underwater Archaeology by Means of a Remotely Operated Vehicle, Conte G., Zanoli S., Scaradozzi D., Gambella L., Caiti A., **ITALY** 243

Simple Tools for Architectural Photogrammetry, Tsioukas V., **GREECE** 712

Mapping of Archaeological Areas Using a Low-Cost Uav: The Augusta Bagiennorum Test Site, Bendea H., Chiabrando F., Giulio Tonolo F., Marenchino D., **ITALY** 117

Obtaining Facade Plan of a Historical Building with Orthorectification of Single Images Gathered By Mobile Phones,and Digital Cameras, Aydar U., Avsar E.O., Altan M.O., **TURKEY** 89

Studies and Knowledge Fusion in Archaeological Site Maps Managed in a 3D GIS, Bonfanti C., Chiabrando F., Spano A., **ITALY** 153

Geomatic Contributions to Archaeological Investigations. The Case of Torrione of Pollenzo (Piedmont-Italy), Bonora V., Preacco C., Spano A., **ITALY** 159

Imagery Information on the Study of Cultural Heritage, Lazaridou M., Patmios E., **ITALY** 441

Experimenting with Museum and User Friendly Video Files Distribution Platform on the Web "Volumeone", Iwabuchi J., **JAPAN** 388

Digital Recording In Archaelogical Excavation Using Tablet PC, Cianciarulo D., Guerra F., **ITALY** 227

Underwater Archaeological Knowledge Analysis and Representation in the Venus Project: A Preliminary Draft, Jeansoulin R., Papini O., **FRANCE** 394

3D Modelling by Advanced Total Station, Yildiz F., Karabork H., Yakar M., Altuntas C., Karasaka L.,Goktepe A., **TURKEY** 749

Photogrammetry for Virtual Exploration of Underwater Archaeological Sites, Drap P., Seinturier J., Scaradozzi D., Gambogi P., Long L., Gauch F., **FRANCE** 281

Photogrammetric Documentation of the Vaults of Historical Monuments, Potuckova M., Stefanova E., Gril S., **CZECH REPUBLIC** 612

Documentation of Destroyed Parts of Monuments Using Low Cost Rectification Techniques, Antoniou G., **GREECE** 79

The Virtual Reconstruction of the "Titane" Archaeological Site (Greece) by Aims of Photogrammetry, Nuttens T., Goossens R., Tytgat C., De Wulf A., Van Damme D., Hennau M., Devriendt D., **BELGIUM** 544

Application Of Mixed Technique For The 3d Modelling Of The Noble Floor Of The Real Villa In Monza, Fassi F., Achille C., Brumana R., Tuncer H., **ITALY** 758

3D Survey Technologies for Reconstruction, Analysis and Diagnosis in the Conservation Process of Cultural Heritage, Salonia P., Bellucci V., Scolastico S., Marcolongo A., Messina T.L., **ITALY** 653

The Euphrates Channel Changes and Archaeology along Jebel Bishri in Syria, Lonnqvist M., Torma M., Okkonen J., Lonnqvist K., Nunez M., Latikka J., **FINLAND** 465

Visualization of the Architecture Through Simplified Models: Strategies for Knowledge Sharing Pieve a Socana, Casentino, Toscana, Battini C., Cornieti M., Fantini F., Iurilli S., **ITALY** 112

3D Digital Reconstruction of Hue Complex of Monuments (Vietnam) and Web Application for a Sustainable Urban Development, Pugnaloni F., Issini G., Fangi G., Dang M.N., **ITALY** 619

Improving Satellite Quickbird-Based Identification Of Landscape Archaeological Features Through Principal Component Analysis And Tasseled Cap Transformation, Lasaponara R., Masini N., **ITALY** 812

The Documentation of the Medieval Entrance of the Rhodes Fortification Complex, Gianniou P., Georgopoulos A., Tsakiri M., Della K., **GREECE** 334

Digital Geometric Documentation of the Rail Journey of the Historic Train of Pelion, Stamnas A., Georgoula O., **GREECE** 691

Session 3
Laser Scanning and automation

UVACAD: A Software Platform for 3D Architectural Surveying, Perez-Moneo Juan-Diego, Tordable J., Finat J., Fernandez J.J., Sanjose J.I., **SPAIN** 828

Automated Modelling of Surface Detail from Point-Clouds of Historical Objects, Nothegger C., Dorninger P., **AUSTRIA** 538

Laser Scanning and Automatic Multi-Image Texturing of Surface Projections, Petsa E., Grammatikopoulos L., Kalisperakis I., Karras G., Pagounis V., **GREECE** 579

From the Relief to the 3D Reconstruction_ The Methodology, Moro A., Vassallo V., Vico L., **ITALY** 501

Session 4
GIS in Cultural Heritage

Archaeological and Methodological Approaches for the Construction of an *Intrasite* And *Intersite* GIS of Elaiussa Sebaste (Turkey), Borgia E., **ITALY** 171

Spatial Information System For 3D Documentation Of Plaka, The Historical Center Of Athens, Charkiolakis N., Ioannidis Ch., Kantza Ch., Keramida I., Koumna A., Leni M., Georgopoulos A., **GREECE** 769

A GIS in Cultural Heritage Based Upon Multiformat Databases And Hypermedial Personalized Queries, Chias P., Abad T., Echeverría E., Da Casa F., Celis F., **SPAIN** 222

Using Smart Map in a Mobile Information Environment for Tourism, Malek M. R., Samany N., Aliabady S., Hajibabai L., Kashyha M., **IRAN** 471

Database "Monarch" for the Keeping and Processing of the Data on Cultural Heritage, Morozov S., Hookk D.Yu, Mazurkevich A.N., **RUSSIAN FEDERATION** 505

Wednesday 03.10.2007

Session 5
Low cost photogrammetric systems

Cost-Effective Rock-Art Recording in a Production Environment: Is There a Wider Message?, Chandler J. H., Bryan P., **U.K.** 210

Implementation of a Low-Cost Photogrammetric Methodology for 3D Modelling of Ceramic Fragments, Kalantari M., Kasser M., **FRANCE** 405

A Tool to Help Mapping Planning in Close Range Photogrammetry, Bernardini A., Fangi G., **ITALY** 129

Low-Cost Image Based System for Non-Technical Experts in Cultural Heritage Documentation and Analysis, Boochs F., Heinz G., Huxhagen U., Mueller H., **GERMANY** 165

The 3D Photo-Logging System for Easy and Effective Recording and Understanding of Archaeological Sites, Kadobayashi R., Seike A., **JAPAN** 400

Session 6
3D Reconstructions based on TLS point clouds

Application of High Resolution Scanning Systems for Virtual Moulds and Replicas of Sculptural Works, Tucci G., Bonora V., **ITALY** 721

Documentation of the Geometry and Earlier Interventions of the Ancient Theater Of Dodona, Antoniou G., **GREECE** 73

3D Height Accuracy Survey and Modelling of one of Aosta's Anthropomorphic Stelae, Bornaz L., Poprorato Ch., Rinaudo F., De Gattis G., Focareta R., **ITALY** 176

Integrating Laser Scanning, Multispectral Imagery and GIS In C&R Documentation Practices: A First Approach Using two XVITH Century Wood Paintings from Convento De Cristo In Tomar, Pires H., Marques P., Henriques F., Oliveira R., **PORTUGAL** 596

RecorDIM Session

Partnership in Learning: English Heritage & the Raymond Lemaire International Centre for Conservation, Andrews D., Bedford J., Blake B., Clowes M., Crispe A., Popworth H., Quintero M.S., **U.K.** 67

Guiding Principles and Illustrated Examples. Recording, Documenting and Information Management for the Conservation of Cultural Heritage Places, Eppich R., LeBlanc F., Chabbi A., Letellier R., **USA** 775

Session 7
Service for the Restoration of Acropolis Monuments

Principles and Methodology of Intervention for Structural Restoration, Ioannidou M., **GREECE** 376

Parthenon Restoration Project, Toganidis N., **GREECE** 706

The Surface Conservation Project of the Acropolis Monuments: Studies and Interventions, Papakonstantinou E., Panou A., Franzikinaki K., Tsimereki A., Frantzi G., **GREECE** 557

The Restoration of the Superstructure of the Propylaia Central Building: Study and Intervention, Tanoulas T., **GREECE** 840

Poster Session 2 – Archaeology & Conservation – GIS

Computerization and Management of Archive Sources for the Study of Urban Cultural Heritage, Lelo K., Travaglini C., **ITALY** 450

The Roman City of Uxama Argeala (Soria,Spain) and its Study by Means of Remote Sensing and Digital Cartography, Gillani G., **SPAIN** 340

Rapid Approach of Integrated Survey for the Conservative Analysis of Pictures, Costantino D., Angelini M.G.,Caprino G., **ITALY** 247

Myanmar: A Comparison Between Past and Present. What is Happening in the Field of Architectural Heritage Conservation: The Techniques Used, the Principles of Preservation Applied and the Relative Plans for Heritage Management, Messeri B., **ITALY** 491

Outcome of the Representation of Architecture: Image and Memory, De Masi P., De Masi A., **ITALY** 265

Integrated Methodologies and Technologies for the Reconstructive Study of Dur-Sharrukin (Iraq), Cultraro M., Gabellone F., Scardozzi G., **ITALY** 253

Recording for Urban Planning: A Case from Manama, Bahrain, Elwazani S.A., Lerma Jose Luis, **SPAIN** 293

Contribution of Laser Scanning, Photogrammetry and GIS to an Interdisciplinary Special Research Program on the History of Mining Activities (SFB HIMAT), Hanke K., **AUSTRIA** 366

The Volponi's Kiln in Urbino. Industrial Archaeology and Historic Landscape in the Cradle of the Renaissance. Documentation, Survey and Drawing , Agostinelli M., Clini P., Lancioni N., Quattrini R., Sabbatini G., **ITALY** 17

National Historic Sites Of Canada: A Values-Based Approach to Posterity Heritage Recording, Leboeuf J.-F., Quimet C., Lumsdon C., Zvonar J., Utas G., **CANADA** 445

Digital Documentation of Monuments of Natural Beauty: A Case Study, Stylianidis E., **CYPRUS** 696

Traditional Drawings Versus New Representation Techniques, Almagro A., Almagro Vidal A., **SPAIN** 52

WEBGIS Open Source Solutions for the Documentation of Archaeological Sites, Agosto E., Ardissone P., Rinaudo F., **ITALY** 29

Raw Materials Project. Archaeological WEBGIS with Googlemaps API, Cantoro G., **ITALY** 199

Utilizing Geographical Information System (GIS) & Satellite Remote Sensing Analysis for Integrated Planning: A Case Study of Paphos District Area - Unesco World Heritage Town (Paphos, Cyprus, Hadjimitsis D., Themistokleous K., **CYPRUS** 362

Moving Towards Conscious Preservation of the Architectural Heritage: Creating A New Professional Role, Bardelli P.G., Guagnini A., **ITALY** 108

Multimedia Database for the Heritage Information System of the Ancyra Project, Gabrielli M., Malinverni E.S., **ITALY** 323

An Important Middle Bronze Age Cemetery at West-Central Anatolia: Dede Mezari, Kocak O., Uyumez M., Cay T., Ilasli A., Iscan F., **TURKEY** 418

The Land and City of Tarhuntassa Geodetic Researches Around it, Bahar H., Cay T., Iscan F., **TURKEY** 93

Spatial Information System For Historic Buildings, Gunay S., **TURKEY** 792

The Completion The Conservation Plan For The M.Kogalniceanu Street Church, Cluj Napoca, Romania, Maksay A., Pirez H., Kandra L., Makay D., **ROMANIA** 823

GIS Application in Archaeological Site of Solunto, Tantillo M. D., **ITALY** 702

Innovative Systems for Assisted Analysis and Diagnosis, Appolonia L., Moltedo L., Picco R., Salonia P., **ITALY** 84

In Sicilian Ancient Theatres Interventions of Restorations in Sicily, Ruggirello V.L., **ITALY** 647

The Use of 3D Reconstruction for Architectural Study: The Asklepieion of Ancient Messene, Yoshitake R., Ito J., **JAPAN** 752

Survey Procedure And Archaeological G.I.S Data Base for the Medieval Mine of Rocca San Silvestro, Bianchini L., Chiaverini I., Ostuni D., **ITALY** 135

Poggioreale Old Town In Sicily: Strategies, Memory, Knowledge And Planning Place, Guglielmini R., **ITALY** 786

The Use of GIS Technology in Culture Heritage, Petrescu F., **ROMANIA** 573

Architectural Patrimony Management in Yemen, Heno R., **FRANCE** 371

Customized GIS Environment for Integrated Management of Archaeological Research Data, Roustanis T., Kaimaris D., Georgoula O., Patias P., **GREECE** 643

Session 8
Architectural Heritage Conservation

Digital Management of the Documentation of the Acropolis Restoration, Mallouchou-Tufano F., Alexopoulos Y., **GREECE** 475

Art Work In Historic Sikh Shrines : Need for their Documentation and Conservation, Singh B., **INDIA** 668

Artistic Heritages: From Knowledge to Valorisation, Di Natale E., Lanzarone F., **ITALY** 271

Documenting Architectural Heritage In Bahia - Brazil, Using Digital Technologies, Amorim, A. L., **BRAZIL** 61

NDT Detection of Decay Areas and Evaluation of their Attributes, Kapsalas P., Zervakis M., Maravelaki-Kalaitzaki P., Delegou E.T, Moropoulou A., **GREECE** 409

Session 9
Information Technology and Cultural Heritage

Digitising Aegean Bronze Age Buildings: Building Typologies From Digital Plans, Constantinidis D., **AUSTRALIA** 238

Merging Augmented Reality Based Features in Mobile Multimedia Museum Guides , Damala A., Marchal I., Houlier, M., **FRANCE** 259

Robust Shape Fitting and Semantic Enrichment, Torsten U., Fellner D. W. , **AUSTRIA** 727

Friday 05.10.2007

Session 10
Modelling Laser Scanner data

Digitization of the Collection of Moldings of the University Marc Bloch in Strasbourg :A Study Case, Smigiel E., Callegaro P., Grussenmeyer P., **FRANCE** 674

The Imprint of a City: Massa Marittima, Micoli M., Nomikou Tz., **ITALY** 497

Laser Scanning for Historical and Geotechnical Studies at Pointe du Hoc, Warden R., Burt R., Briaud J.L., Everett M., **USA** 845

Facade Modelling for Historical Architecture, Bohm J., Haala N., Becker S., **GERMANY** 147

Session 11
Archaeological conservation

Social and Spatial Patterns of Cultural Heritage, Charalambous N., **CYPRUS** 216

Basic Idea and Material: An Integrated Approach, from the Knowledge to the Conservation, Ientile R., Marotta A., Rinaudo F., De Bernardi M. L., Chiabrando F., De Santis A., Naretto M., **ITALY** 382

Documentation and Monitoring of Intangible Cultural Heritage – A 21st Century Approach, Robinson E.-J., **U.K.** 637

Influence of the Substrate Colour on the Visual Appearance of Gilded Sculptures, Dumazet S., Genty A., Zymla A., De Contencin F. X., Ruscassier N.,Bonnet B., Callet P., **FRANCE** 287

Session 12
e-Technology, Education and Training

A Digital Future for Cultural Heritage, Mudge M., Ashley M., Schroer C., **USA** 521

The Project of the Italian Culture Portal. A Standard Based Model for Interoperability Amongst Cultural Heritage Data Sources, Masci M.-E., Buonazia I., Merlitti D., **ITALY** 481

A Virtual Collaborative Environment for Archaeology Through Multi-User Domain in the Web, Pietroni E., Forte M., **ITALY** 585

Cultural Heritage Inventory System of Turkey on the Web, Cayirezmez A., **TURKEY** 207

State of the Art in Built Heritage Internet Applications: Which Trends are Leading this Field?, Lancia R., **ITALY** 429

Poster Session 3 – Laser Scanning – Animation & Modeling

Ajax Web Scripting Applied to Interactive Stereoscopic Imaging , Pomaska G., **GERMANY** 602

Laser Scanner & Photogrammetry for the Survey of the Monumental Cemetery in Piazza Del Duomo, Pisa (Italy), Caroti G., Piemonte A., **ITALY** 201

Recording and Virtual Modelling of a Roman Villa Through Laser Scanning, Aguilera G. D., Gomez J., Munoz A.L., Herrero J.S., **SPAIN** 35

First Experiences with the Deformation Analysis of a Large Dam Combining Laserscanning and High-Accuracy Surveying, Aguilera G. D., Gomez J., Sanchez A., Sanchez J.A., **SPAIN** 40

3D Buildings Modelling Based on a Combination of Techniques and Methodologies, Pop G., Bucksch A., Gorte B., **ROMANIA** 607

Using Hybrid Surveying Techniques for Documenting the Largest Ancient Theatre in Greece, Vozikis G., **GREECE** 739

"2 Different Techniques of Scanning Culture Heritage" 1.Close-Range-Scanning of 250 Clay figurines in Xian, China, 2.Laser-Scanning of 3.200 Dinosaur-Steps in Sucre, Boliva, Linsinger S., **AUSTRIA** 460

The Development of Virtual Museum in Iran. Presenting Historic Buildings of Azerbaijan Province, Iran, in 8 Historic Complexes, Combination of Different Models and Materials, Pirbabaei M.T., Pour-Rahimian F., Ibrahim R., **IRAN** 590

Reverse Engineering Architectural Hardware, Waggoner T., **CANADA** 743

3D Digital Modelling as a Method for the Reconstruction of the Historical Image of the City: The Case of Piazza Bodoni In Turin (Italy) at the End of Nineteenth Century, Spallone R.., **ITALY** 680

Evaluation of Structural Damages from 3D Laser Scans, Sanjose Jesus I., Fernandez-M. J.J., Perez-Moneo J.D., Finat J., Martinez J., **SPAIN** 834

New Application Field for the Handyscan 3D: The Res Gestae Divi Augusti of the Augustus Temple (Ankara).A Restoration Survey, Bornaz L., Botteri P., Porporato C., Rinaudo F., **ITALY** 182

A Combination of Modern and Classic Methods of Surveying Historical Buildings - The Church St. Valentin in the South Tyrol, Burger A., Grimm - Pitzinger A., Thaler E., **AUSTRIA** 188

Process Evaluation of 3D Reconstruction Methodologies Targeted to Web Based Virtual Reality, Koutsoudis A., Arnaoutoglou F., Pavlidis G., Tsioukas V., Chamzas CH., **GREECE** 423

Laser Scanner and Architectural Accuracy Text, Adami A., Guerra F., Vernier P., **ITALY** 7

Digital Representations and Analysis of Deformations Induced in Map Supporting Materials, Adami A., Fregonese L., Guerra F., Livieratos E., Tsioukas V., **GREECE** 12

Towards Creating a Dialogue Between the Specialized Technician and non Technician Users of the 3D Laser Scanner, Haddad N., **JORDAN** 350

3D Laser Scanner and Reflectorless Total Station: A Comparative Study of the Slots of El-Khazneh at Petra in Jordan, Haddad N., Ishakat F., **JORDAN** 356

The Grumentum's Arena: Measure, Geometry and Shape, Balletti C., Guerra F., Pillon M, Sartorelli L., **ITALY** 102

Documentation of the Zazadin Inn with Laser Scanning, Coktepe A., Yildiz F., Karabork H., Yakar M., Altuntas C., Karasaka L., **TURKEY** 235

Surveying and Documentation of Detailed Historical Heritage by Laser Scanning, Altuntas C., Yildiz F., Karabork H., Yakar M., Karasaka L., **TURKEY** 58

Modelling and Visualization Using Laser Scanner in Documentation of Cultural Heritage, Karabork H., Yildiz F., Yakar M., Altuntas C., Karasaka L., **TURKEY** 415

Methodology of 3D Digital Survey Operations and Data Processing According to Architectonic Investigations in Archaeological Area, Verdiani G., Di Tondo S., **ITALY** 735

Filining Lacunas in Terrestrial Laser Scanning Data: The "Cavallo Ligneo" of the "Palazzo Della Ragione" (Padua, Italy), Fabris M., Achilli V., Bragagnolo D., Menin A., Salemi G., **ITALY** 301

High Density Digital Form for Cultural Heritage: Synthetic Modelling and Reverse Engineering of the Four Horses of the Basilica of San Marco In Venice, Fassi F., Fregonese L., Brumana R., Monti C., Achille C., Cassani C., Vio E., **ITALY** 317

Transportable 3D Acquisition Systems for Cultural Heritage. Reverse Engineering And Rapid Prototyping of the Bronze Lions of the Saint Isidoro Chapel in the Basilica of San Marco In Venice, Achille C., Brumana R., Fassi F., Fregonese L., Monti C., Taffurelli L., Vio E., **ITALY** 1

Laser Scanning Methodology for the Structural Modelling, Fabris M., Achilli V., Bragagnolo D, Menin A., Salemi G., **ITALY** 307

Laser Scanning Support Architectural Mappings and Historical Urban View Analysis, Oreni D., Brumana R., Fassi F., Brumana R., Prandi F., Tuncer H., **ITALY** 548

Villa Adriana in Tivoli:A Method of Survey for Archaeological Heritage, Clini P., Fiori F., Sciarra N., **ITALY** 230

3D Modelling of Heritage Objects by Fringe Projection and Laser Scanning Systems, Przybilla H.-J., Peipe J., **GERMANY** 615

3D Tools for Scientific Visualization and Documentation of Archaeological Heritage, Case Study: A Sassanid Shrine of Daregaz, Northeastern Iran, Niknami K. A., Mirashe Z., **IRAN** 533

Session 13
Spatial Information Management

GIS And Web-GIS, Commercial and Open Source Platforms: General Rules for Cultural Heritage Documentation, Rinaudo F., Agosto E., Ardissone P., **ITALY** 625

GIS-Based Impact Assessment Model In Urban Historic Culture Heritage Protection and Planning, Shi R., Liu M., **P.R. China** 664

Application Of A Gis For The Accessibility Of Archaeological Sites By Visitors With Disability And Visitors With Reduced Mobility, Ioannidis Ch., Vozikis K. Th., **GREECE** 797

Practice for Built Environment Awareness: From Survey to 3D Modelling and Related Database, Ballabeni M., Ricciotti Angelillo D., **ITALY** 96

Session 14
Photogrammetric Recording Applications

Digital 3D Reconstruction of Antonio Gaudi's Lost Design for a Church Near Barcelona Spain, Moser M., Hanke K., **SPAIN** 509

Photogrammetric Documentation and Visualization of Choli Minaret and Great Citadel in Erbil/Iraq, Pavelka K., Svatuskova J., Kralova V., **CZECH REPUBLIC** 567

Combination of Terrestrial Recording Techniques For 3D Object Modelling Regarding Topographic Constraints. Example of the Castle of Haut-Andlau, Alsace, France, Landes T., Grussenmeyer P., Voegtle T., Ringle K., **FRANCE** 435

Photogrammetric Documentation and Digital Representation of the Macedonian Palace in Vergina, Patias P., Saatsoglou-Paliadeli Ch., Georgoula O.,Pateraki M.,Stamnas A.,Kyriakou N., **GREECE** 562

Topographic and Photogrammetric Recording of the Acropolis of Athens, Moullou D., Mavromati D., **GREECE** 515

Saturday 06.10.2007

Session 15
Non-conventional Photogrammetric applications

A Digital Map for the Interior Restoration of St. Ninian's Cathedral , Nickerson S., **CANADA** 527

Saint Anthony's Chapel Facade Pathology Documentation, Gardiol M.-R., Pighini A.M., **ARGENTINE** 329

Documentation of a Vernacular House with Close-Range Digital Photogrammetry, Akbaylar I., Hamamcioglu-Tutan M., **TURKEY** 46

Quickbird Imagery Processing For The Extraction Of Archaeological Features: Performance From Data Fusion Algorithms, Masini N., Lasaponara R., **ITALY** 817

Session 16
3D Rendering and Virtual Environments

Virtual Delphi: Two Case Studies, Flaten A. R., Gill A. A., **USA** 780

Passing Excellence, the Interactive Art Visualization of the Kizhi Ensemble, Tsoupikova D., **USA** 716

The Metopes of Selinunte: Presentation of the Interactive CDROM, Beraldin J-A., Bandiera A., Valzano V., **CANADA** 123

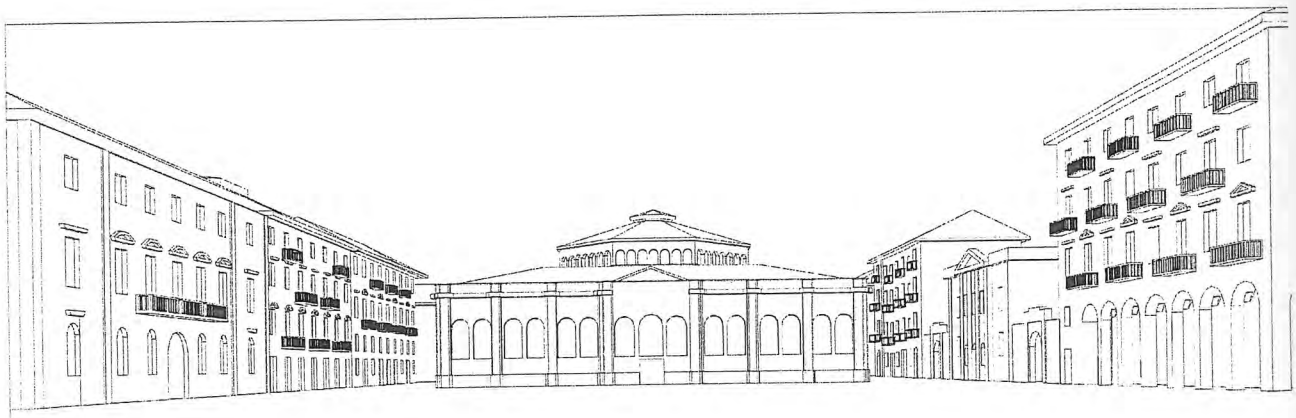
3D DIGITAL MODELLING AS A METHOD FOR THE RECONSTRUCTION OF THE HISTORICAL IMAGE OF THE CITY: THE CASE OF PIAZZA BODONI IN TURIN (ITALY) AT THE END OF NINETEENTH CENTURY.

R. Spallone[a]
[a]DINSE, I Facoltà di Architettura del Politecnico di Torino, Viale Mattioli 39, 10125 Torino, Italy, - roberta.spallone@polito.it

KEY WORDS: Architecture, Digital, Modelling, Reconstruction, Research, CAD, Representation

ABSTRACT:

The experience that I want to present consists of the case of piazza Bodoni in Turin, characterized, between 1866 and 1924 by the presence of an original pavilion dedicated to market.
The 3D digital reconstruction allows to recognize the role that the building of the market plays in the characterization and identification of this specific urban location as an essential element in the image of the city.
To reconstruct the architectural and urban morphology of the place, I have conducted researches on iconographical records of the urban setting and of the historical market at the Turin city archives. In my researches I discovered a large number of tables, consisting of city plans of the area and architectural designs of the buildings around the square.
The research project was also based on other information culled from period photographs sources in others archives and in bibliographic sources.
The rich iconography that emerged from the archival records has enabled me to address the research to an attempt to simulate the activities of market that existed historically within his specific location.
The data drawn from historical-archival and bibliographical sources were compared and integrated with the planimetrical and altimetrical survey, prepared by me, of still existing buildings.
I designed the virtual piazza Bodoni with its market, consisting in a closed pavilion that was demolished in the 1920s.
The 3D perspective visualizations of the square, revealed an image that reminds the paintings of the "ideal cities" of Italian Renaissance.



1 TO RECONSTRUCT FOR RECOGNIZING IN THE PRESENT THE HISTORICAL IMAGE OF THE URBAN FABRIC.

"... to reconstruct means to collaborate with the time in his shape of 'past', to pick up the spirit or to modify it, to stretch it out, almost, towards a longer future, means to discover under the stones the secret of the springs..."
Marguerite Yourcenar, Mémoires d'Hadrien, 1951

The reconstruction of the historical images of a urban fabric, as well as of buildings or complexes, allows viewing through its present aspect the different looks it had in the past, and recognizing their traces.
Thanks to digital modelling it is possible to go back in the time and to recover images of places today modified.
Besides thanks to digital modelling, the 3D visualization of the morphological transformations of the urban fabric in various historical periods makes it possible to share this information and diffuse it in a readily understandable form to a wide-ranging spectrum of public.
The urban setting of "piazza Bodoni" in Turin nowadays appears to the visitor as an unitary composition of buildings of the second half of nineteenth century, characterized by homogeneous style and, on the southern side, by a continue curtain with arcades.
Only one building, on the southern-eastern side of the square, shows as a contemporary architecture of the second half of the twentieth century.
As a matter of fact, another building on the eastern side of the square, the Conservatoire of Music of Turin, had not origin in the same period of the other buildings of the urban fabric.
It was built at the end of 1920's, in place of a not very well-know building, sometimes described as "octagonal pavilion",

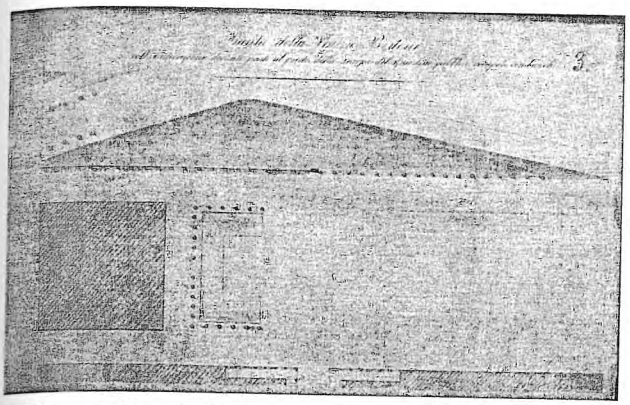


Figure 1. Plan of piazza Bodoni with the shed of the market in the half of nineteenth century
(ASCT, Tipi e disegni, 15.5.126/3)

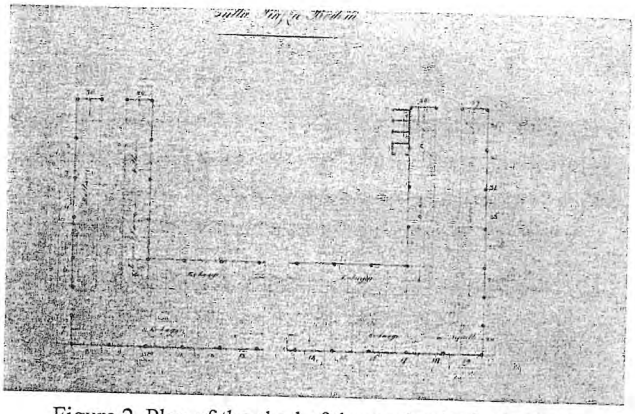


Figure 2. Plan of the shed of the market in the half of nineteenth century
(ASCT, Tipi e disegni, 15.5.126/2)

demolished in 1924.
It was a closed pavilion, built between 1864 and 1866, in function as market and public wash-house.
It originated along with the urban setting it had been inserted into. Its location was one that was originally in the outskirts of the city, along the town's southern barricades.The space was cleared when the eighteenth-century walls were knocked down.
As is documented in some archival records, the activities of market in this place preceded the construction of the pavilion. In the half of the nineteenth century on the western side of the square there was a U-shaped shed, for the wholesale of fruits and vegetables and, on the northern side, forty moveable stands (figure 1).
An iconographical record of the shed (figure 2) shows the distribution of the 65 stands under cover and the merchandise sold (vegetables, legumes, flours, cheeses, butter, poultry, lambs, fishes, cooked foods).
Around the shed there were other 30 stands.
A record of 1857, together with a historical view (figure 3), supports by document the presence in the square of pedlars of vegetables, eggs, poultry, butter and fruits.
In 1863 the Municipality deliberated the building of the new pavilion, on the eastern side of the square, to replace the old shed.
The engineers Edoardo Pecco and Carlo Velasco designed (1864-1866) a square-shaped building surmounted by an octagonal drum (figure 5).

The report and the drawings were published in the magazine "Il Giornale del Genio Civile"(1865) in which it is affirmed that the nearly finished building "is good for the beauty and for the regularity of the square".
The pavilion was built on two floors: on the ground floor there was the market with 300 ring-shaped fixed structure of the stands, on the underground floor there were the public wash-house and 180 stock yards.
It was built with bricks and stones walls and covered by wood, iron and cast iron structure.
In the market were sold: meat, poultry, butter, eggs, tripe, cheeses, pasta, fishes, fruits and vegetables.
In 1888 an extraordinary snowfall caused the fall down of the roof; the structure was rebuilt completely in metal by design of Carlo Velasco (figure 7).
In 1893 the interior of the pavilion was modified: the number of stands was reduced from 300 to 118 (with different distribution), and two large stock yards were built (figure 6).
In 1924 the Municipality deliberated the demolition of the pavilion.
The 3D digital reconstruction allows to recognize the role that the building of the market plays in the characterization and identification of this specific urban location as an essential element in the image of the city.
To reconstruct the architectural and urban morphology of the place, I have conducted researches on iconographical records of the urban setting and of the historical market at the Turin city archives.

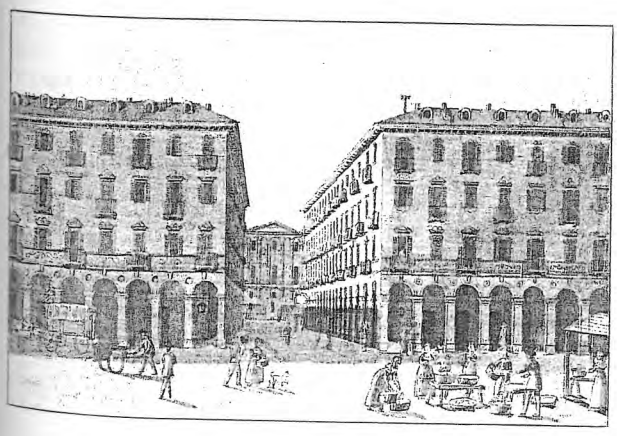


Figure 3. Marco Nicolosino, view of piazza Bodoni,
(ASCT, Collezione Simeom, D 238)

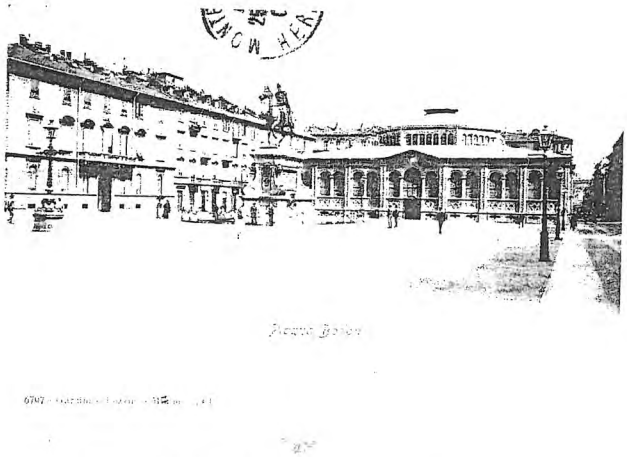


Figure 4. Piazza Bodoni in an old postcard, (1904)

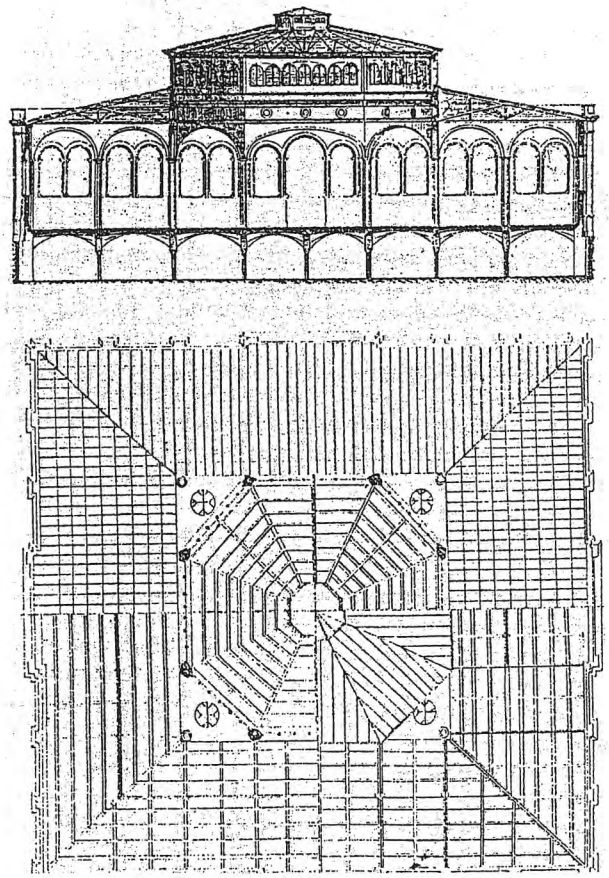


Figure 5. Pavilion for market and wash-house,
("Il Giornale del Genio Civile", 1865)

In my researches I discovered a large number of tables, consisting of city plans of the area and architectural designs of the buildings around the square.
On the bases of archival records it was possible to reconstruct the shape of the urban fabric with the pavilion between 1893 and 1924 (figures 8-9).

The research project was also based on other information culled from period photographs sources in others archives and in bibliographic sources.
The rich iconography that emerged from the archival records has enabled me to address the research to an attempt to simulate the activities of market that existed historically within his specific location. The data drawn from historical-archival and bibliographical sources were compared and integrated with the planimetrical and altimetrical survey, prepared by me, of still existing buildings.

2. 3D DIGITAL MODELLING FOR VISUALIZING THE HISTORICAL RECONSTRUCTIONS.

The reconstruction of the historical evolution of a urban fabric allows viewing through its present aspect the different looks it had in the past, and recognizing their traces.
Francesca Cataliotti wonders about the purpose of such studies, and suggests possible answers. "Why reconstruct? Perhaps is it possible to restore the identity, the sense of *unicum*, by adding up fragments and appearances?
We reconstruct because of a sort of intellectual pleasure which the architect cannot do without, because of the necessity to satisfy that romantic taste of reviving, if only on the drawing board, the original shape of the ancient monument, in order to understand what has disappeared, in part or whole,... or, perhaps, is it the architecture itself that asks to be represented in order to be understood and enjoyed at a distance, in time and space?
The reconstructive representation is, first of all, a way to understand the object and could become an important tool of historic and iconographic research...". (Cataliotti, 2001)
3D digital modelling offers in this respect a powerful method of checking hypotheses. Notes Gabriele Rossi: "in a 3D digital model, the complexity of the representation gives way to an illustrative schematization which has, in any case, better spatial control of the object and far exceeds the traditional static axonometric and perspective forms of representation.
The model thus becomes an essential tool to check and control the validity of reconstructive hypotheses". (Rossi, 2000)

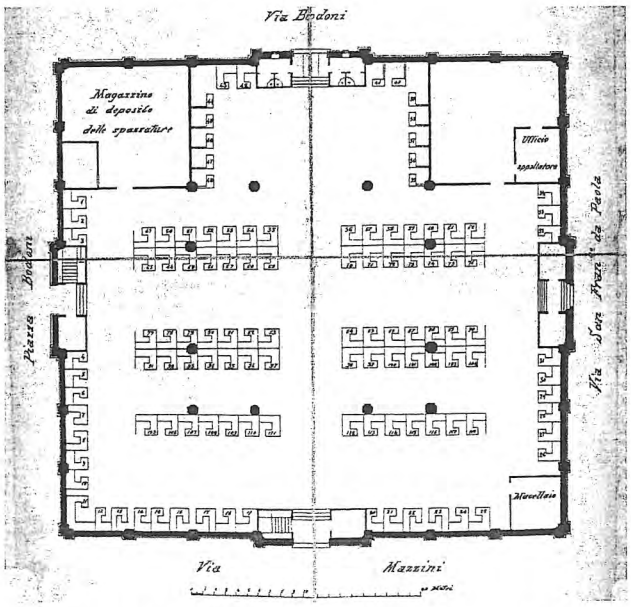


Figure 6. Plan of the ground floor of the market, after 1893,
(ASCT, Collezione Q XIV, n. 5, lotto VIII)

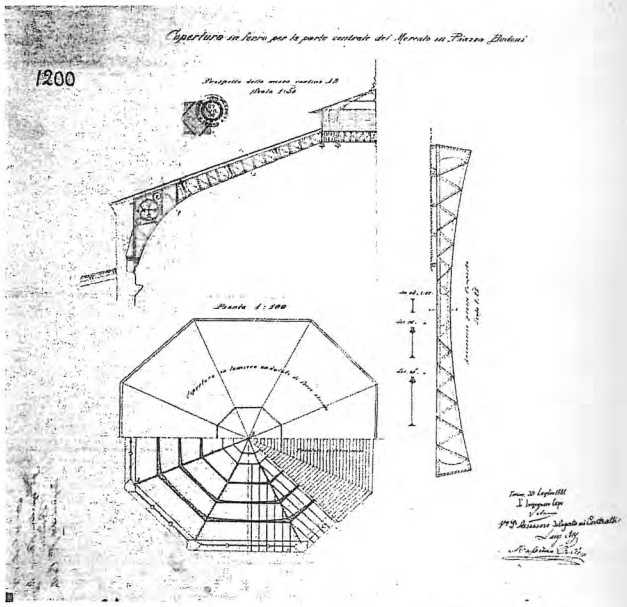


Figure 7. Carlo Velasco, structure of the roof, 1888
(ASCT, Tipi e disegni, 15-5-63)

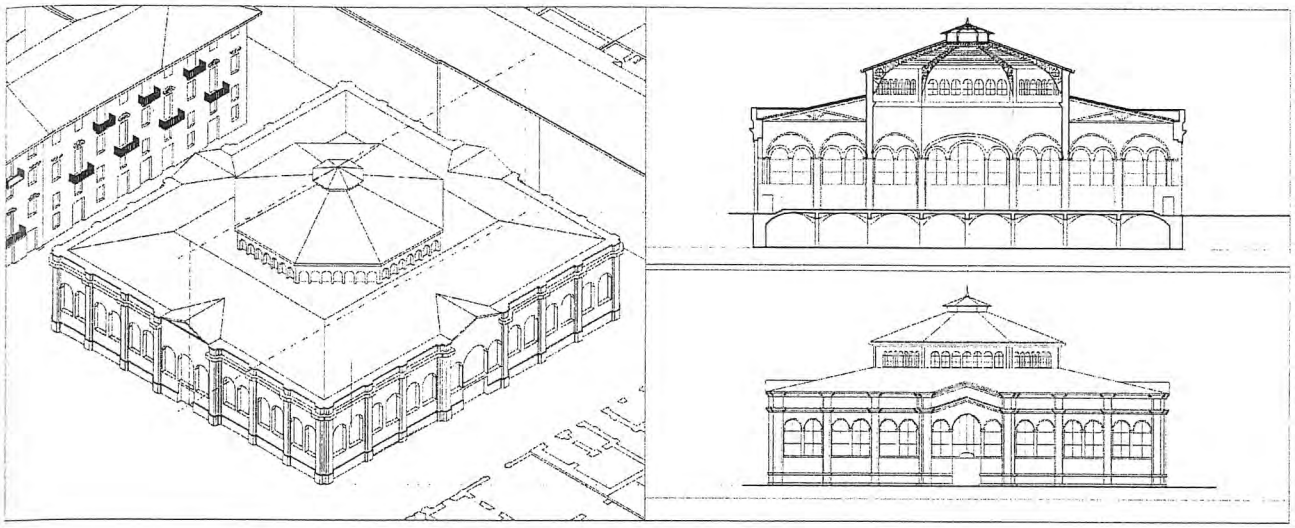


Figure 8. 2D and 3D reconstruction of the pavilion for market and wash-house,
(Drawing and model by Roberta Spallone)

3. 3D DIGITAL MODELLING AS A TOOL FOR KNOWLEDGE.

3D digital modelling, a technique of representation by now widely consolidated in the various design phases, is presently stirring a renewed interest for the survey of existing structures.
This is, on the one hand, due to the natural connection with the most innovative methodologies of instrumental survey. On the other, it is a consequence of the wide-ranging potential applications in the fields of critical thematic analyses and of spatial and temporal simulation: "*digital mock-ups* [...] allow a richer and more controlled interaction between user and model [...] *digital mock-ups* are able to cover, within a unique representation system, the entire range of possible modelling". (Maldonado, 1992).
The quick evolution of digital technologies, hardware and software, makes it ever easier to build 3D models of considerable geometrical complexity.
A critical selection of data, first of all in respect of the relationship between scale and contents of the representation, is absolutely essential to avoid, in the modelling phase, very complex procedures adding insignificant detail which uselessly increases the size of the digital file. In this respect it should be considered that the most suitable support for the visualization of the model in its space-time dimensions usually is the monitor of a personal computer.
While 2D digital drawings now usually implement a level of detail that is greater than the level achieved, for the same scale of reduction, in a traditional drawing, it is most appropriate to simplify 3D digital modelling by implementing primitive solids, by analogy with material plastic modelling.
3D digital modelling complements drawing as an information and communication tool, while adding, as a specific prerogative, the possibility to enter the fourth dimension.
This important aspect is underlined by Claudio Moriconi, who observes that "with the digital support the drawing simulates the hypothetical reality, overcomes static limitations and allows interacting with any kind of sign.
By creating virtual images, digital graphics is probably the most suitable tool to interpret the complexity of reality [...]". (Moriconi, 2001)
The creation of a 3D digital model offers, as a result, infinite possibilities of observation: from the objective visualization of a cylindrical projection, to the subjective visualization of a conical projection. In this respect Mario Docci and Riccardo Migliari state that: "modelling is not only a creative strategy, but also a cognitive one. Digital models allow 3D simulations... Computerized models are conceived as 3D systems, real *maquettes* that live in a virtual space perfectly corresponding to a real space, so much so that they encompass all four dimensions. They are visible through a screen, a window (which reminds the window of Alberti's *perspectiva artificialis*). This window visualizes the models in a 2D space that can be perceptive (in a central projection) or measurable (in a parallel projection), with the capability to vary the point of view so as to simulate the mobility and the transformability in time and appearance". (Docci, Migliari, 2000)
The urban fabric of piazza Bodoni characterized, between 1866 and 1924 by the presence of an original pavilion dedicated to market, was a test case of the potential of 3D digital modeling for the historical reconstruction.
Thanks to digital modelling, the 3D visualization of the morphological transformations of the urban fabric as well as of buildings or complexes in various historical periods makes it possible to share this information and diffuse it in a readily understandable form to a wide-ranging spectrum of public.
"The digital techniques of representation make it possible to create a picture of the situation before and after the intervention, and to rebuild, if necessary, the stratification too.
The era of graphic papers that only the specialists can decipher is over. Now the very users of a building or of an urban complex can appreciate spaces [...] before during and after its irreversible transformation". (Moriconi, 2000)

4. INTEGRATED METHODOLOGIES OF ANALISYS: FROM ARCHIVAL, ICONOGRAPHICAL AND BIBLIOGRAPHICAL REASEARCHES, TO DIRECT METRICAL SURVEYS, TO 3D MODELLING.

The reconstruction of the evolution of the buildings required the geometric modelling of the exterior. This was based on data drawn from historical-archival, iconographical and bibliographical sources integrated with the recent planimetrical and altimetrical survey by Roberta Spallone (Calorio, Spallone, 2001), and additional measurements directly taken in a survey of the exterior.
3D digital modelling required a critical selection of the data

with the goal of simplifying the representation of the geometrical external shape, of the buildings. For the reconstruction of the demolished pavilion, based on a work published in a historic magazine (Giornale Genio Civile,1865), on archival iconographical records, on archival photographs (FondazioneTorino Musei, Fondo Gabinio).
The AutoCAD 2006 software package was used for the preparation of the 3D digital model, for different visualizations and for renderings.
The model was used to produce a set of axonometric and perspective views of the exterior.
The 3D perspective visualizations of the square, revealed an image that reminds the paintings of the "ideal cities" of Italian Renaissance.

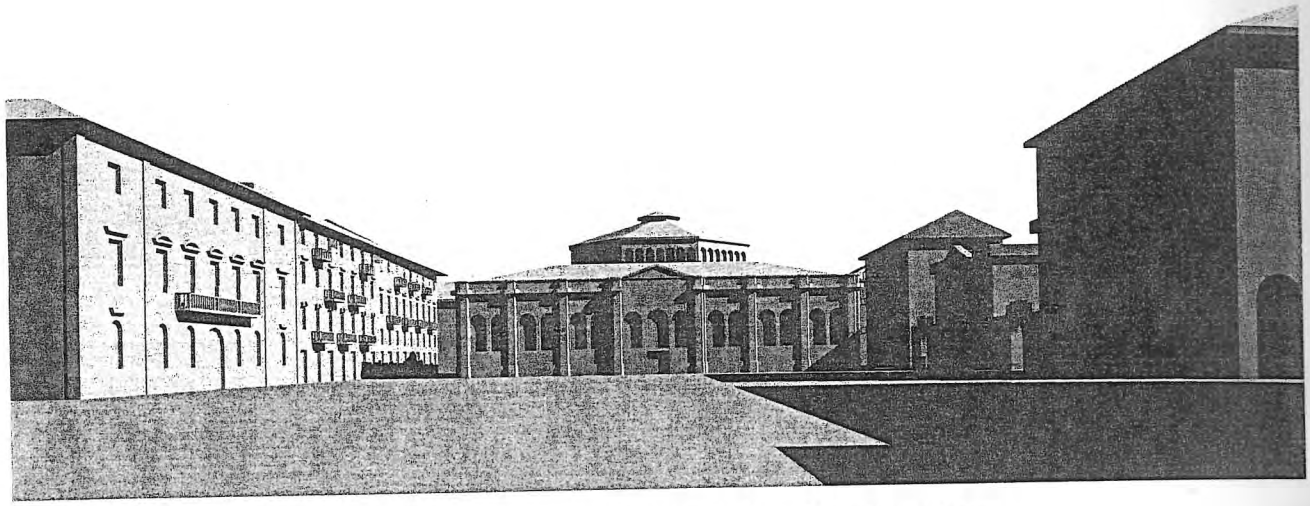


Figure 9. 3D reconstruction of the pavilion for market and wash-house, (model and rendering by Roberta Spallone)

References

Bardelli, PG., Testa, L., 1995. Il complesso di saldatura tra il Borgo Nuovo e la fascia marginale degli ampliamenti secenteschi. In: Dipartimento di Ingegneria dei Sistemi Edilizi e Territoriali, Torino nell'Ottocento e nel Novecento, Celid, Torino, pp. 186-216.

Calorio GF., Spallone R., 2001. Piazza Bodoni. In: Coppo, S., Davico, P. (a cura di), Il disegno dei portici a Torino. Architettura e immagine urbana dei percorsi coperti da Vitozzi a Piacentini, Celid, Torino, pp. 391-399

Cataliotti, F., 2001. "Simulare" l'architettura. In Soletti, A., Belardi, P., Cataliotti, F. Claudio Moriconi professione infografico, Università degli Studi di Perugia, pp. 119-130.

Comoli Mandracchi, V., Torino, 1983. Laterza, Roma-Bari

Docci, M., Migliari, R., 2000. La modellazione come strategia creativa e conoscitiva. Il rilevamento dell'Amphytheatrum Flavium. In Baculo, A. Architettura e informatica, Electa, Napoli, pp. 37-52.

Edifizio per pubblico mercato e lavatoio nella Piazza Bodoni in Torino, 1865. In: "Giornale del Genio Civile, 1.

Foglino, A., 1978. Mercati in Torino nell'ottocento. Il mercato di piazza Bodoni. In: "Atti e Rassegna Tecnica Società Ingegneri e Architetti in Torino", 3-4.

Garzino, G., 1995. Il Borgo Nuovo carloalbertino nei terreni della Rocca e degli smantellamenti Baluardi di mezzodì. In: Dipartimento di Ingegneria dei Sistemi Edilizi e Territoriali, Torino nell'Ottocento e nel Novecento, Celid, Torino, pp. 438-467.

Maldonado, T., 1992. Reale e virtuale, Feltrinelli, Milano.

Mantovani, S., 2000. Nella tradizione dei grandi mercati ottocenteschi. Piazza Bodoni. In: Barosso L. et al. Mercati coperti a Torino, Celid, Torino

Moriconi, C., 2001. Il modello virtuale. In Soletti, A., Belardi, P., Cataliotti, F. Claudio Moriconi professione infografico, Università degli Studi di Perugia, pp. 20-30.

Rossi, G., 2000. Ricostruzione grafica e modello solido. Carl Weichardt a Pompei. In Baculo, A. Architettura e informatica, Electa, Napoli, pp. 121-123.

Scarzella, P., 1995. Il Borgo Nuovo di Carlo Felice a notte del Viale del Re. In: Dipartimento di Ingegneria dei Sistemi Edilizi e Territoriali, Torino nell'Ottocento e nel Novecento, Celid, Torino, 468-502

Spallone R., 2006. Il disegno dei mercati nella città storica. In: Coppo, S., Osello, A. (a cura di), Il disegno di luoghi e mercati a Torino, Celid, Torino, pp. 76-108