

**Author/ Affiliation**

**Editor(s):** Filippo Stanco; Sebastiano Battiato, *University of Catania, Italy*;  
Giovanni Gallo, *University of Catania, Italy*

**Series:**

- Digital Imaging and Computer Vision

**Features:**

- Surveys the latest techniques, algorithms, and solutions for digital imaging and computer graphics-driven cultural heritage preservation
- Summarizes recent advances in 3D reconstruction of archaeological sites
- Provides an overview of the state-of-the-art research in contributed articles from recognized experts in the field
- Contains numerous examples, illustrations and figures summarizing the results of experimentation on real data
- Includes a table of contents, illustrations and figures, summary, and bibliography for further reading in each chapter

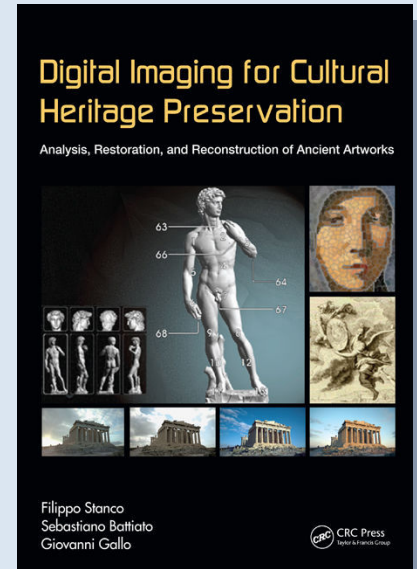
**About the Book:**

This edition presents the most prominent topics and applications of digital image processing, analysis, and computer graphics in the field of cultural heritage preservation. The text assumes prior knowledge of digital image processing and computer graphics fundamentals. Each chapter contains a table of contents, illustrations, and figures that elucidate the presented concepts in detail, as well as a chapter summary and a bibliography for further reading.

Well-known experts cover a wide range of topics and related applications, including spectral imaging, automated restoration, computational reconstruction, digital reproduction, and 3D models.

**Select Content:**

(\*See reversed side.)



**Price:** \$139.95  
**Cat. #:** K11154  
**ISBN:** 9781439821732  
July 2011

Order online at:

[www.crcpress.com](http://www.crcpress.com)

**Save 20%!**  
**Enter code 181AE at time of checkout. Plus, receive Free shipping!**

**SIGN UP ONLINE AND RECEIVE INFORMATION ABOUT OUR LATEST OFFERINGS AND SPECIAL DISCOUNTS!**

Select Content:

**Experiencing the Past: Computer Graphics in Archaeology, F.**

*Stanco and D. Tanasi*

The Past and the Future: Archaeology and Computer Science  
From the Field to the Screen: 3D computer graphics and the Archaeological Heritage

The Archeomatica Project  
Archaeological 3D Modeling  
Haghia Triada, Crete

Polizzello Mountain, Sicily  
Digital Restoration  
Dealing with Image Data in Archaeology: New Perspectives

**Using Digital 3D Models for Study and Restoration of Cultural**

**Heritage Artifacts, M. Dellepiane, M. Callieri, M. Corsini, and R. Scopigno**

Visual Communication of Art  
Art Catalogs and Digital Repositories  
Digital 3D as a Tool for Art Scholars  
Physical Reproduction from the Digital Model  
Virtual Reconstruction and Reassembly  
Supporting the Restoration Process

**Processing Sampled 3D Data: Reconstruction and Visualization**

**Technologies, M. Callieri, M. Dellepiane, P. Cignoni, and R. Scopigno**

Basic Geometric Processing of Scanned Data  
Color Sampling and Processing  
MeshLab: An Open Source Tool for Processing 3D Scanned Data  
Efficient Visualization and Management of Sampled 3D Data  
3D Digitization: How to Improve Current Procedures and Make It More Practical and Successful

**ARC3D: A PublicWeb Service that Turns Photos into 3D Models, D.**

*Tingdahl, M. Vergauwen, and L. Van Gool*

System Overview  
Automatic Reconstruction Pipeline  
Practical Guidelines for Shooting Images  
Case Study: Reconstruction of the Mogao Caves of Dunhuang  
Examples

**Accurate and Detailed Image-Based 3D Documentation of Large Sites and Complex Objects, F. Remondino**

Reality-Based 3D Modeling  
Photogrammetry

**Digitizing the Parthenon: Estimating Surface Reflectance under Measured Natural Illumination, P. Debevec, C. Tchou, A. Gardner, T.**

*Hawkins, C. Poullis, J. Stumpfel, A. Jones, N. Yun, P. Einarsson, T.*

*Lundgren, M. Fajardo P. Martinez*

Background and Related Work  
Data Acquisition and Calibration  
Reflectometry  
Results  
Discussion and Future Work

**Applications of Spectral Imaging and Reproduction to Cultural**

**Heritage, S. Bianco, A. Colombo, F. Gasparini, R. Schettini, S. Zuffi**

Colorimetric and Multispectral Color Imaging  
Capturing a Multispectral Image  
Imaging and Signal Processing Techniques  
Recovery Multispectral Information from RGB Images  
Storing a Multispectral Image  
Evaluating System Performance  
Multispectral Image Reproduction  
Final Remarks

**Did Early Renaissance Painters Trace Optically Projected Images?**

**The Conclusion of Independent Scientists, Art Historians, and**

**Artists, D.G. Stork, J. Collins, M. Duarte, Y. Furuichi, D. Kale, A. Kulkarni,**

*M.D. Robinson, S.J. Schechner, C.W. Tyler, N.C. Williams*

The Projection Theory  
Image Evidence  
Documentary Evidence  
Material Culture and Re-Enactments  
Non-Optical Contexts  
The "Value" in Tracing

Scholarly Consensus

**A Computer Analysis of the Mirror in Hans Memling's Virgin and**

**Child and Maarten van Nieuwenhove, S. Savarese, D.G. Stork, A. Del**

*Pozo, R. Spronk*

Memling's Diptych  
Computer Vision Analysis  
Modeling Reflections Off a Mirror Surface  
Results

**Virtual Restoration of Antique Books and Photographs, F. Stanco, A.**

*Restrepo Palacios, G. Ramponi*

Detection of the Defects  
Virtual Restoration of Antique Photographic Prints Affected by Foxing and Water Blotches  
Restoration of the Fragmented Glass Plate Photographs  
Restoration of Yellowing and Foxing in Antique Books  
On Image Quality

**Advances in Automated Restoration of Archived Video, A. Kokaram,**

*F. Pitie, D. Corrigan D. Vitulano, V. Bruni, A. Crawford*

Dirt and Missing Data  
Semi-transparent Defects  
Line Scratches  
Global Defects  
An Evolving Industry

**Computational Analysis of Archaeological Ceramic Vessels and Their Fragments, A.R. Willis**

Artifact Reconstruction Systems: Basic Components and Concepts

Computational Models for Vessels and Their Fragments  
Vessel Reconstruction by Sherd Matching: 3D Puzzle Solving  
Current Trends in Computational Artifact Reconstruction

**Digital Reconstruction and Mosaicing of Cultural Artifacts, E.**

*Tsamoura, N. Nikolaidis, I. Pitas*

The Three-Step Object Reconstruction Procedure  
Approaches for Object Reconstruction  
Automatic Color-Based Reassembly of Fragmented Images and Paintings  
Reduced Complexity Image Mosaicing Utilizing Spanning Trees

**Analysis of Ancient Mosaic Images for Dedicated Applications, L.**

*Benyoussef, S. Derrode*

Recent Image-Processing Projects Concerned with Mosaics  
Tesserae Extraction  
Tessera-based Segmentation and Coding  
Guidelines Estimation for Mosaic Structure Retrieval  
Open Issues and Research Directions in Mosaic Image Analysis

**Digital Reproduction of Ancient Mosaics, S. Battiato, G. Gallo, G.**

*Puglisi G. Di Blasi*

Art and Computer Graphics  
History of Ancient Mosaics  
The Digital Mosaic Problem  
The Crystallization Mosaics  
The Ancient Mosaics  
The Ancient Mosaics in a 3D Environment  
Final Discussions

**Pattern Discovery from Eroded Rock Art, Y. Cai**

Surface Imaging Methods  
Pattern Discovery Methods  
From Reconstruction to Knowledge  
Interaction Design

**Copyright Protection of Digital Images of Cultural Heritage, V.**

*Cappellini, R. Caldelli, A. Del Mastio, F. Uccheddu*

2D Watermarking  
3D Watermarking