

Digital Remaking of San Baudelio de Berlanga

Columbia University Graduate School of Architecture, Planning and Preservation

A6307 / Advanced Studio III HP Technology Studio

Fall 2016 / Mondays and Tuesdays (alternate weeks) 26pm / 6 pts

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Course overview

This projectbased studio explores advanced applications of digital preservation technology through international realworld fieldwork. Drawing on previous knowledge of architectural structures systems and materials, students will employ cutting edge 3D scanning, photogrammetry and printing technologies to devise an experimental preservation treatment for a historic building. Students will carry out high resolution 3D and color recordings of the Hermitage of San Baudelio de Berlanga in Spain as well as a series of frescoes at the Met. We will then experiment with how to reassemble the pieces digitally, and envision ways in which the construction of a replica could reunite the scattered fragments in the building. Students will consider technology in a broader cultural, political and aesthetic context. They will inform their approaches with archival research, materials science research and other relevant research in order to address the range of issues opened up in the course.

Topics

Noncontact recording

Digital mediation

Conservation facsimiles

Originality and Authenticity

Raw data

Surface and Shape

High resolution scanning

Multilayer files

Digital restoration

Reunification

Technology workshops

The goal of the studio is to explore the potential of noncontact digital technology to documenting cultural Heritage and to helping the preservation, study and dissemination of sensitive buildings. Thanks to the collaboration of the Factum Foundation and the Metropolitan Museum of Art, we will work with advanced

technology to record the color and surface of a series of frescoes at the Cloisters (New York, September) and the Hermitage of San Baudelio (Spain, October). A twoday long training session in Factum Arte workshops in Madrid has also been planned as part of the course, in which we will be able to see different types of technology that can be used in Heritage preservation: 3D scanning, 3D printing, CNC prototyping, multilayer color printing, etc.

Studio travel

The studio will take students to Spain on October 7-16. Students will train at Factum Arte workshops in Madrid and will visit the Hermitage of San Baudelio to carry out 3D and color recording of part of its structure. We will also visit some of the main art and architecture landmarks in Madrid (including the 6 frescoes of San Baudelio in the Museo del Prado) as well as recent preservation, adaptive reuse and sensitive architectural projects. There will also be the possibility to visit Segovia, Sigüenza and Toledo.

Studio sequence

At the beginning of the semester a number of case studies will be described in which the obtention of digital recordings and the production of facsimiles have been essential for the preservation of historic sites and artifacts. Various key concepts mentioned in these introductory classes will be explored during the course as we learn to use specific recording systems.

The first part of the course will be focused on recording surface with high resolution 3D laser scanning technology. We will learn to operate the Lucida scanner, a system specifically designed for the field of conservation; and we will learn how to process the recorded data as well as to combine it with other layers of information such as color, to creating multilayer files.

The second part of the course will be focused on recording shape and color with photogrammetry, a technique for obtaining 3D information out of taking multiple photographs. We will learn how to plan a recording session, how to take the images and how to process them to obtain a 3D model that is meaningful for documentation purposes. Finally we will learn innovative techniques for digital restoration, both in color and 3D, that will offer us the possibility to explore alternative narratives of an existing site or artifact, while preserving the original.

Schedule

09/06 Class 1. Introduction

09/12 Class 2. Recording surface

09/26 Class 3. Processing 3D as tonal data

09/27 Class 4. Multilayer files

10/24 Midterm review

10/25 Midterm discussion

11/14 Class 5. Digital restoration I

11/15 Class 6. Digital restoration II

11/28 Class 7. Combining data from different sources

11/29 Class 8. Conservation facsimiles

12/12 Final review

12/13 Final discussion

Complementary activities

09/1314 Workshop on 3D scanning at the Cloisters, New York

10/1011 Workshop on photogrammetry in Factum Arte, Madrid

10/27, 6.30pm Round table hosted by Adam Lowe (optional)

Resources

factumfoundation.org

en.wikipedia.org/wiki/San_Baudelio_de_Berlanga

metmuseum.org/visit/metcloisters

museodelprado.es/en/