

# NEH Application Cover Sheet (HAA-263878)

## Digital Humanities Advancement Grants

### PROJECT DIRECTOR

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**Field of expertise:** Italian Literature

### INSTITUTION

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The Regents of the University of California, Santa Cruz  
Santa Cruz, CA 95064-1077

### APPLICATION INFORMATION

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**Title:** *Virtual Studiolo*

**Grant period:** From 2019-01-01 to 2020-06-30

**Project field(s):** Art History and Criticism; Music History and Criticism; Women's History

**Description of project:** The Italian Renaissance is famed for art, architecture, music, and learning. The integrated experience of these achievements is difficult to grasp, given the dispersal of physical evidence and the disciplinary confines of our learning. It is also often gendered as male. This online, virtual reality project for study of one of Renaissance Italy's most stunning art spaces and collections-the studiolo of Isabella d'Este (1474-1539)-will address both of these problems with cross-disciplinary tools for approaching the period through one of its most important women. Its immersive, interactive character will convey the human scale, cognitive density, and aesthetic specificity of a Renaissance art space and capture the multi-sensory complexity of interiors meant to dazzle visitors with humanist ideals. Individual and collaborative work in this environment will foster new approaches to studying and teaching the multi-media Renaissance and provide models for analogous projects in other periods.

### BUDGET

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|                         |           |                     |           |
|-------------------------|-----------|---------------------|-----------|
| <b>Outright Request</b> | 99,897.00 | <b>Cost Sharing</b> | 0.00      |
| <b>Matching Request</b> | 0.00      | <b>Total Budget</b> | 99,897.00 |
| <b>Total NEH</b>        | 99,897.00 |                     |           |

### GRANT ADMINISTRATOR

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**NEH Digital Advancement Grant level II**  
**Title: Isabella d’Este: Virtual Studiolo**  
**Applicant: University of California, Santa Cruz**  
**Principal Investigator: Deanna Shemek, Professor of Literature**  
**Co-Principal Investigator: Anne MacNeil, Associate Professor of Music**

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| Andrea Hesse, UC Santa Cruz Divisional Computing |    |
| Peter Assmann, Palazzo Ducale, Mantua            |    |
| Adam Lowe, Factum Foundation                     |    |
| Alan Craig                                       |    |
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## **2. List of participants**

### **Principal Investigator**

Deanna Shemek, Professor of Literature, University of California Santa Cruz

### **Co-Principal Investigator**

Anne MacNeil, Associate Professor of Music, University of North Carolina, Chapel Hill

### **Collaborators at Cineca Interuniversity Consortium Italy (CINECA)**

Antonella Guidazzoli

Maria Chiara Liguori

Daniele DeLuca

Silvano Imboden

### **Free-lance assistant technicians**

Beatrice Chiavarini

Federica Farroni

### **Consultants on the Historic Studiolo of Isabella d'Este**

Stephen Campbell, Professor of the History of Art, The Johns Hopkins University

Molly Bourne, Director, Graduate Program in Art History, Syracuse University in Florence

Peter Assmann, Superintendent, Ducal Palace Museum of Mantua

### **Authors of Letters of Support**

Adam Lowe, Factum Foundation

Alan Craig, Digital Humanities, Arts and Social Sciences Specialist, Extreme Science and Engineering Discovery Environment (XSEDE)

### 3. Narrative

#### Enhancing the Humanities

The project aims to produce and enable new research and teaching by inviting students and scholars into a Renaissance visual and acoustic experience that was meant to be immersive: in-the-round, floor to ceiling, and textured by sound and reading. It will join other projects in *IDEA: Isabella d'Este Archive*, a collaborative, multi-disciplinary Website for study of the Italian Renaissance that presents information through the figure and activities of one of the period's most important female protagonists.

American art collectors and museum founders Isabella Stewart Gardner (1840-1924) and Peggy Guggenheim (1898-1979) could count as a female role model the Italian Renaissance princess, Isabella d'Este of Mantua (1474-1539). Her acclaimed collection—a prototype of the signature modern art gallery—once filled a suite of rooms in what is now Mantua's Ducal Palace Museum. Breaking with far more modest practices by women who displayed small collections of family portraits and religious objects, Isabella borrowed a cultural form from male princes of her time. Upon her marriage (1490) to Marchese Francesco II Gonzaga, she determined to design one of the fully-realized culture spaces that men were calling *studioli* (studies). Isabella was passionate and tireless in commissioning prestigious artworks and lavish decorations for this personal and public relations project. Gilded ceilings, intarsia panels, frescoes, tiles, and personal emblems adorned her study *studiolo*, while her collections of books, cameos, Roman antiquities, Renaissance bronzes, and musical instruments played starring roles in the space's projection of her learning.

Dominating the *studiolo* were seven large paintings that now number among the Italian masterpieces in the Louvre: two each by Andrea Mantegna, Lorenzo Costa and Antonio Allegri da Correggio, and one by Pietro Perugino. A striking instance of personal “branding,” the *studiolo* was unparalleled in Isabella's own time as an architectural and artistic expression of explicitly feminine Renaissance culture. It served as a space for display, conversation, and performance to be shared with visitors, but also as a personal retreat from court affairs to a safely bounded, richly curated place where art might summon the human passions in all their intensity and foster thoughtful reflection. For its coherence and the gender of its creator, Isabella's *studiolo* is a frequent point of reference in the history of Western art, yet for centuries it has been accessible only in scattered pieces.

As documented in detail by Clifford M. Brown (and in Anne MacNeil's film in *IDEA Music/a, Ad tempo taci*, at 5:35), Isabella's *studiolo* remains but has sustained significant renovations. Many of its paintings and sculptures survive, but they dwell in museums around the world, divorced from the compact, personalized context of her Mantuan rooms. Virtually transporting Isabella's paintings and sculptures from enormous galleries of the Louvre, Vienna's Kunsthistorisches Museum (KHM), and other locations back into the compressed space of her Mantuan quarters, this project will reclaim the *studiolo*'s original proportions and reunite the rooms with their contents. *Studiolo* objects, architecture, décor, and music will dialogue anew with each other, revealing for study intense relations and patterns that have been indiscernible since the dispersal of the collection in 1627.

A simple but striking example of this type of dialogue appears in our concept demonstration video, viewable in *Idea Art/e* (see 1:06-1:12). As a suggestion of the *studiolo* floor, we photographed just two surviving tiles from the original space and “paved” the entire room with them in our 3D model. This addition revealed a spectacular correspondence between floor and ceiling design that sketches one immersive effect of the space and urges further study of the relations among *studiolo* architectural elements. Similarly, art and music historians have only a conjectural grasp of the cognitive, rhetorical, and aesthetic effects produced by the co-presence of different objects and media in the *studiolo* space. The paintings in the Louvre, arrayed in a single row on the wall of a major gallery, or the bronze statuettes enclosed in glass cases in Vienna's KHM cannot convey the situated experience of the viewer surrounded by artistic masterpieces in a tiny study, as she stands atop elaborately glazed tiles beneath an ornate ceiling. Likewise, musicologists will encounter the rhetorical and acoustic effects of music played inside the *studiolo*, rather than in a modern concert space, some of which was experimented in *Ad tempo taci*. And while literary scholars are well aware of the contents of Isabella's library and her reading tastes,



precious little analysis has been devoted to the *studiolo* as an illustrated reading room in dialogue with its books. This project will render the *studiolo* legible as a situated, multi-media experience and open new horizons for its meaning among researchers, teachers, and students in these and other fields.

We will produce a 3D realization of the Virtual Studiolo suitable for VR headsets/Google cardboard, accompanied by a 3D version for laptops and visualization walls. Users will find in the Virtual Studiolo new opportunities for individual and collaborative work through measurement, tagging, color selection/sorting, situated music listening, and cross-reference with other IDEA online projects: our archive of Isabella's correspondence, our ceramics project, our music projects, and the bibliography project that is about to launch.

The project will develop a world map featuring the current locations of all surviving contents from the historic *studiolo* and a timeline of acquisitions and dispersal to aid research about collections development. Since a central principle of the original *studiolo*'s organization was that of the Renaissance *paragone*—the evaluative comparison of works in dialogue with each other—the Virtual Studiolo will extend this curatorial and analytical orientation, enabling users to create individualized narrative itineraries and emphases by moving and rearranging the *studiolo*'s contents (art, books, music, medals, cameos etc.) for different dialogic and comparative effects. Moveable and removable objects will also permit users to empty the space entirely and appropriate the Virtual Studiolo as the locus of new online exhibitions. Our interests lie in virtual reassembly based on existing scholarly research and in fostering new thinking about the Italian Renaissance through these interactive tools, but we also aim to inspire a reactivation of the *studiolo* as an open-inquiry, display, performance, creative laboratory space where new virtual installations will be possible thanks to today's technologically powered Renaissance.

### Environmental Scan

We aim to combine the capacities for self-directed exploration found in recently developed entertainment products with the philological rigor of museum and foundation work in digital cultural heritage initiatives. Online resources for the study of the Italian Middle Ages and Renaissance are few and are largely limited to sites devoted to specific authors and texts, such as the excellent Digital Dante <https://digitaldante.columbia.edu>. Nothing compares precisely to our multi-disciplinary, online VR immersive approach to a three-dimensional, enclosed space and the activities it hosted. A short 2010 educational video on the *studiolo* of Francesco I de' Medici <https://www.youtube.com/watch?v=vefzSog3KRw>, and artist Thomas Demand's insightful discussion of the Montefeltro *studiolo* at Gubbio (now in New York's Metropolitan Museum) <https://www.youtube.com/watch?v=vefzSog3KRw> are among the limited tools we currently have for exploring Renaissance *studiolo* spaces or other interiors.

- Numerous projects of the Factum Foundation <http://www.factumfoundation.org> represent the state of the art in digital recording of cultural heritage objects and environments, both for research/teaching and for public enjoyment. Factum's *Scanning Seti* was an immersive exhibit that replicated a pharaonic tomb, focusing on the experience of the space and charting its modern rediscovery. The *Polittico Griffoni* project is similar to ours in that it reunited a series of Renaissance paintings that are now dispersed, placing them virtually back in the church where they were originally located. Neither of these projects offers online tools for further research or interactive teaching (See attached letter of support from Factum).
- The *Städel Time Machine* for Gear VR and Oculus Rift allows users both guided and self-directed exploration options for touring Frankfurt's Städel Museum as it was in the 19<sup>th</sup> century. <https://www.oculus.com/experiences/gear-vr/796067960495193/> We like the annotation visualization in this project, the options it includes for both guided and independent exploration of the historic museum, the comparisons it offers between the current space and its earlier iterations, and the time machine presentation. This application is based on Unity. We will opt instead for Unreal or a similar open-source tool.
- Google Cultural Institute's *Breugel: Unseen Masterpieces* is a comprehensive, expertly conceived virtual

reassembly of all of Breugel's paintings that allows users to plunge into several works by virtue of Giga pixel technology and animation. We are aiming to adapt this project's combination of online exhibits, lectures, painting annotations, and immersive photography. *Breugel* does not include an historic architectural interior, individual user annotation, or story creation, all features we are developing, and it is not a research-oriented project. In a future phase, we aim to offer at least one immersive painting experience such as this project has achieved.

[https://www.google.com/culturalinstitute/beta/exhibit/aQISPDLEJx7\\_Kw](https://www.google.com/culturalinstitute/beta/exhibit/aQISPDLEJx7_Kw)

- *Virtual Paul's Cross* is a suggestive point of reference for acoustic effects we aim to include in the Virtual Studiolo, including not only concerts played inside our space but ambient noise from the windows <https://vpcp.chass.ncsu.edu> *Virtual Paul's Cross* is a multimedia project incorporating visuals and sound that focuses on specific historical events and uses visual models built in Sketchup. We are able to employ photogrammetry for our 3D models, which offer a higher degree of realism and allow precise measurement.
- Since our project is an interface for museum, classroom, and research uses, we are watching closely the developments in museums across the world. Paris's National Museum of Natural History (taxidermy objects in VR); Tate Modern's London's recent Modigliani retrospective (a virtual artist's studio, based on historical documentation); and the VR program of Helsinki's National Museum, highlight both the appeal and the financial constraints of the alliance between museums and digital technology. <https://www.nytimes.com/2018/03/12/arts/european-museums-get-adventurous-with-virtual-reality.html> We seek to learn from their example on numerous fronts.

### History of the Virtual Studiolo Project

The Virtual Studiolo (VS) joins a set of inter-related projects within *IDEA: Isabella d'Este Archive* <http://isabelladeste.web.unc.edu>, an open-access, online environment for study of the Italian Renaissance. *IDEA* has been building its scholarly core of documentary, musical, and art historical resources since 2012. We currently have four sites (*IDEA Lettere/e*, *IDEA Music/a*, *IDEA Art/e*, *IDEA Home*) each featuring projects headed by a distinct PI. These also include three films we produced by *IDEA* researchers: MacNeil's film in *Idea Music/a*, *Ad tempo taci* (2,099 viewings as of June 4); the Virtual Studiolo concept demonstration video in *IDEA Art/e* (2,239 viewings); and Valerie Taylor's *The Illustrated Credenza* in *IDEA Ceramics* [See *IDEA Art/e*], which also resides on YouTube (2,149 views, combined). All are being adopted for classroom use by enthusiastic university and K-12 colleagues, many of whom express appreciation for these tools, while our more specialized *Letter/e* platform containing Isabella d'Este's correspondence (28,000 items) in high-resolution manuscript images counts 558 registered users from around the world. Our newest project, which was launched just this month by a team from Scotland, is the Zotero-based *IDEA Bibliography* <http://isabelladeste.web.unc.edu/2018/05/project-launch-idea-bibliography/>.

Exploratory Skype conversations about the VS among Cineca, Shemek, and MacNeil in 2013 were followed by a 2014 meeting at CINECA headquarters in Bologna. In 2015, we assembled our group at UNC-CH for a seminar on Big Data for Intimate Spaces. In 2015, we began direct negotiations with the Palazzo Ducale. A 2016 grant from the Kress Foundation enabled us to produce a concept-demonstration video, including a photogrammetric survey of the existing *studiolo* space in Mantua. This video won the Online Jury Award in the Future Film Festival: International Festival of Cinema Animation and New Technologies in 2017. The additional collaboration of Vienna's KHM allowed us to begin to create and collect 3D models of surviving *studiolo* objects.

Funded by the UC Humanities Research Institute (UCHRI), our team met in California for a week in July 2017 and will meet again in Bologna in July 2018. In March 2018, we finalized an agreement with the KHM for production and use of high-resolution images (scheduled for delivery in 2018) for use in the creation of 3D models of nine objects from its collection that were in Isabella's *studiolo*. Factum.org has agreed to facilitate our negotiations with the Louvre to record the paintings, and to lend its technology for the recording. If for any reason this agreement is not feasible, we will build the VS with already available images of the paintings, at lower resolutions.

Since 2017, VS team members have been invited numerous times to present the IDEA project in conference, university, and public settings in the US, Canada, Europe, and Australia. These occasions have enabled us both to publicize the project and to gather information about user desires for its design. We have also been collecting data through a User Story survey tool on the *IDEA Art/e* site. Our photogrammetry of the historic *studiolo* space was featured in the popular, prime-time Italian science television show, Superquark in 2017 (link on IDEA's Home page).

With NEH funding, we can achieve milestones 1 and 2 of the project, as outlined below. If ONLY Milestones 1 and 2 are achieved, users will have at their disposal a 3D Virtual Studiolo environment, current and historic iterations of the floor, a lighting variation tool, a measuring tool, an interactive map of the collection's dispersal, and 3D models of three important statuettes from Isabella's collection.

## Work Plan

**Software:** WebGL framework + JavaScript, Blender, The GIMP, Krita, PhotoScan, SVN, Apache, RAW processing software, Oculus library (choices to be determined), Game engine (such as (b) (4) or equivalent). Our development will favor the use of an open pipeline and, whenever proprietary software should be used, will guarantee the file format porting. For the interactive map, we are considering (b) (4)

. This choice will figure into our research work.

**Process:** PI and Co-PI will provide regular analysis and recommendations for scholarly content of the project. PI will organize semi-monthly Skype consultations with Cineca tech team and consult with scholarly collaborators/advisors. We plan travel for several meetings: an organizational meeting at Cineca in early year 1, work for PI and Co-PI at Cineca and in museums in late year 1, an evaluative meeting at Cineca for our team in year 2, and a research / writing period in Europe for PI in the final months of year two. We also plan two presentations at the PI and Co-PI's universities for which we request travel funds.

Our Tasks address the strategic management and smooth coordination of the project and include planning toward next Milestones, evaluating immersive device choices, holding further meetings with museum directors and curators, and writing a publication or white paper comparing actual and digitally created spaces and discussing what new knowledge was produced by our work.

We will punctuate our work with **milestone Events** to be shared via social media, live presentations, and the IDEA site. Beginning with an empty space, we will share our progress with the public, allowing people to follow our process. Each Event represents both a technological innovation, and a research interest that it serves. Via social media and classroom and conference presentations, we will collect feedback evaluating our product. For time frames regarding each Task, see Appendix 1.

| Work Package 1 Technical Management and Research Coordination Tasks |                                      |
|---|--------------------------------------|
| Administrative and financial activities                             | UCSC and UNC                         |
| Technical Management of the project                                 | Guidazzoli, Imboden                  |
| Research coordination   | Shemek, MacNeil, Guidazzoli, Liguori |
| Data management plan and back up implementation                     | Imboden and UCSC and UNC technicians |
| Article evaluating project results                                  | Shemek                               |
| Research planning for future actions                                | Shemek, MacNeil                      |

## Milestone 1. The space.

**Deliverable:** a landing page containing our 3D model of the empty studiolo and grotta.

- Obtain additional photogrammetry of *studiolo* elements (intarsia cabinets, niches).

- Build simulation of the *studiolo* floor, using additional surviving tiles.
  - Insert a tool that will permit users to take measurements of the *studiolo* space.
  - Enable virtual simulation and hiding of architectural elements that were added over time.
  - Include a time slider that marks the historical arrival of features and contents in *studiolo*.
  - Simulate lighting at different times of day within the Virtual Studiolo.
  - Produce 3D VR visualization of the space for headsets (no interactions).
- Research objectives:** Begin to understand the *studiolo* as an architectural space. Compare Brown's diagrams and measurements of the *studiolo* with those that emerge from our work. Create the conditions for study of the *studiolo*'s contents in proportion to their original space.

### Tasks to be performed for the delivery of Milestone 1

| <b>Work Package 2. The Virtual Studiolo Space Cycle 1 (Milestone 1) - Tasks</b>        |   |
|--|---|
| Asset repository Set up  | Imboden   |
| Web site update and development of the interactive map                                 | Shemek, MacNeil                                 |
| User requirements analysis   | De Luca, Bellavia                               |
| Additional photogrammetry of studiolo elements   | De Luca, Chiavarini, Farroni, Liguori           |
| 3D Virtual Studiolo models optimization  | De Luca, Chiavarini, Farroni                    |
| Visual interface Design phase 1  | Imboden, De Luca                                |
| Interaction Design: Floor phase 1  | De Luca   |
| Interaction Design: Navigation phase 1   | Imboden, De Luca                                |
| Interaction Design: Lighting phase 1   | Imboden, De Luca                                |
| Visual interface Implementation phase 1  | Imboden, Chiavarini                             |
| Floor Implementation phase 1   | Farroni   |
| Navigation Implementation phase 1  | Imboden, Chiavarini                             |
| Lighting Implementation phase 1  | Imboden, Chiavarini                             |
| User experience analysis phase 1   | Bellavia, Liguori                               |
| Researchers' Virtual Studiolo Testing phase  | Shemek, MacNeil                                 |
| Researchers' Virtual Studiolo Items choice   | Shemek, MacNeil                                 |
| Research and development of interactive map  | Shemek, MacNeil                                 |
| <b>Work Package 4. The Virtual Studiolo Space Cycle (Milestones 1) - Tasks</b>         |   |
| Feedback analysis from researchers   | Imboden, De Luca, Guidazzoli, Liguori, Bellavia |
| Interaction Design: time bar   | Imboden   |
| Measurements tool Design   | Imboden, De Luca                                |
| Measurements tool Implementation   | Imboden, De Luca                                |
| Time bar implementation  | Imboden, De Luca                                |
| Virtual Studiolo public version implementation   | Imboden, De Luca, Chiavarini                    |
| <b>Work Package 5. Virtual Studiolo for Head Mounted Display (Milestone 1) - Tasks</b> |   |
| Virtual Studiolo Head Mounted Display Design   | Imboden, De Luca                                |
| Virtual Studiolo Head Mounted Display implementation phase 1                           | Imboden, De Luca, Chiavarini                    |
| Virtual Studiolo Head Mounted Display Testing  | Imboden, De Luca, Guidazzoli, Liguori, Bellavia |

|  |                              |
|--|------------------------------|
| Virtual Studiolo Head Mounted Display final implementation | Imboden, De Luca, Chiavarini |
|--|------------------------------|

## Milestone 2. The statuettes.

**Deliverable:** a prototype for the inclusion of 3D art objects within the space configured in Milestone 1. Our test data will include three of the small, bronze and gold statuettes owned by the KHM, which are small enough to be held in the hand and to position around the space.

- Using the KHM photographs, begin constructing a repository of 3D objects that may be inserted and positioned by users in the Virtual Studiolo space.
- Based on the additional photogrammetry campaign of Milestone 1, locate this repository visually in one of the intarsia cabinets of the Virtual Studiolo.
- Test ways of moving and placing the statuettes in different *studiolo* locations.

**Research objectives:** Enable study of these objects' scale in context, and of potential narrative relations between them and their space. Create the conditions for interactive study of the statuettes in relation to other contents that will be added in successive Milestones.

## Tasks to be performed for the delivery of Milestone 2

| Work Package 3. The Virtual Studiolo STATUETTES (Milestone 2) - Tasks |                  |
|---|------------------|
| Intarsia cabinets reconstruction (at least 1)                         | De Luca, Farroni |
| KHM Photographs Analysis and Correction                               | De Luca, Farroni |
| 3D Reconstruction (item 1)  | De Luca, Farroni |
| 3D Reconstruction (item 2)  | De Luca, Farroni |
| 3D Reconstruction (item 3)  | De Luca, Farroni |

| Work Package 4. The Virtual Studiolo Space Cycle (Milestone 2) - Tasks |                              |
|--|------------------------------|
| Object interaction implementation (cabinet)                            | Imboden, Chiavarini          |
| KHM objects insertion  | Imboden, Chiavarini          |
| Lighting Implementation lighting phase 2                               | Imboden, Chiavarini          |
| User experience analysis phase 2                                       | Bellavia, Liguori            |
| Virtual Studiolo public version implementation                         | Imboden, De Luca, Chiavarini |

## Final product and dissemination

IDEA and Cineca have a consistent record of disseminating our progress and project results on our websites. We have articles published (*Early Modern Women*) and forthcoming (*DH Quarterly*) discussing plans and challenges for IDEA, and will be leading a seminar on digital project challenges at the Renaissance Society of America's annual meeting in 2019. A public Cineca event on 28 June 2017 highlighted the Virtual Studiolo video and was streamed online. Shemek and MacNeil have done talks, poster presentations, and keynote addresses about the Virtual Studiolo at major conferences in our fields. Cineca presented features of the Virtual Studiolo at the 2017 meeting of Siggraph, the world's largest conference and exhibition for computer graphics work. Cineca maintains an active Twitter feed, sharing techniques, for example, for the 3D modeling of the lute seen in our video. By pairing milestones with roll-out events/publications we build into our process the sharing of all aspects of the Virtual Studiolo. Our software is open-source. We are currently exploring universal design and access principles for the project. Our white paper will continue this practice, examining the differences between real and virtual experience of the *studiolo*, and looking toward further developments of the Virtual Studiolo.



## 4. Biographies

**Deanna Shemek** is Professor of Literature at the University of California, Santa Cruz. She co-directs IDEA: Isabella d'Este Archive and served as producer for the concept-demonstration video for this project. She edited and translated 830 of Isabella d'Este's letters (published 2017), is finishing a monograph on Isabella d'Este as a Renaissance correspondent, and has long experience studying Isabella d'Este's activities. In the Virtual Studiolo she serves as PI. She leads project management, coordinating the work of the technicians, researchers, and scholarly advisors and secures agreements with museums and other institutions. She will produce the interactive provenance map of *studiolo* contents, assist with the Wordpress site curation of the project, collect user feedback, and research and write the resulting publication.

**Anne MacNeil** is Associate Professor of Music and Comparative Literatures at the University of North Carolina, Chapel Hill. She was awarded a Digital Innovations Lab Faculty Fellowship in 2014, which provided year-long training in digital research, visualizations, and project management. MacNeil has twice served on NEH panels for Digital Innovation fellowships evaluation. She was the recipient 2017 of a Mellon/NEH fellowship for her IDEA Music/a project, *Italian Songs from the Time of Christopher Columbus*. In the Virtual Studiolo, she serves as Co-PI and as general IDEA Webmaster and designer for our Wordpress sites, assists in project management, and directs the music features of the project. For this grant, she will continue these tasks and work also on the research and design for the interactive map.

**Antonella Guidazzoli** is Head of the Visit Lab Cineca (Visual Information Technology Laboratory), which specializes in VR public humanities outreach projects. She holds a Masters in Electronic Engineering and a Masters in History, "cum laude." She is an expert in scientific visualization, scene reconstruction for forensic applications, cultural heritage fruition, virtual archaeology, and film making for edutainment. A director of numerous Cineca projects, several of which have won prestigious awards, for the Virtual Studiolo she serves as project manager and supervisor for the Cineca tech team and is their main interface with the PI and Co-PI.

**Maria Chiara Liguori** is Head and coordinator of the MUVI project and has worked at VisitLab Cineca since 2012 as Virtual Heritage Coordinator. She holds a PhD in History and Computing, a Masters in Political Sciences; and a Masters in Contemporary History. Her expertise lies in the history of material culture, Women's Studies, and ICT for Digital Heritage. She collaborated on "Apa the Etruscan discovering Bologna," and other digital projects, including the concept-demonstration video for the Virtual Studiolo. She is currently working on I-Media-Cities Horizon, a 2020 EU project. For the Virtual Studiolo she will contribute to historical research, coordinate content between the humanistic group and the tech team, provide philological input on the 3D modeling, analyze "user story" data from humanistic users in order to determine technical requirements for meeting these demands, and contribute to organizational logistics and scientific writing about the project.

### Supervised Tech Team of Guidazzoli and Liguori

**Silvano Imboden** holds a Masters in Computer Science and joined Cineca in 2000. He is an expert in scientific visualization, forensic analysis, real-time rendering, offline rendering, movie production, virtual archaeology, seismic imaging, software design, user interface/interaction design and programming and has presented papers at Siggraph, Eurographics, the Blender conference, and other scholarly meetings. Currently he is working with the I-Media-Cities Horizon 2020 EU project. For the Virtual Studiolo, he will lay out procedural guidelines and workflow as technical director and develop necessary software components. He will also set up the Render Farm and real-time and collaborative visualization systems and serve as advisor on hardware and software choices.

**Daniele De Luca** holds a Masters in Computer Science. He has been a computer graphics generalist and Blender artist at Cineca since 2011 (archviz stills, movies, photo matching insertions, real-time visualizations, character design, animation, environmental modeling, compositing, video editing). He

contributed to "Apa the Etruscan discovering Bologna," three "Ati" (Experience Etruria) film shorts, and the video for "Isabella d'Este Virtual Studiolo. He is currently working with I-Media-Cities Horizon 2020 EU project. For the Virtual Studiolo, he will lay out guidelines for the reconstruction of Isabella's environments and collections, supervising and coordinating the computer graphic work. Working with Imboden, he will integrate software and hardware technologies with the graphics pipeline.

**Giovanni Bellavia** holds a Masters in Philosophy and a degree in Fine Arts. His expertise lies in digital painting, drawing on natural materials, videoart and live performances. He is founder and art director of the artistic collective "The Dummies" and joined Cineca in 2012. He served as director and screenplay writer for "Ati" (Experience Etruria) movies and for the Isabella d'Este Virtual Studiolo video. He is currently working on the I-Media-Cities Horizon 2020 EU project. For the Virtual Studiolo he will serve as art director for immersive environments and coordinate the project's visual interface in response to user profiles produced in our testing.

#### **Freelance assistants**

**Federica Farroni** holds a Masters in Construction Engineering and Architecture and has collaborated with Cineca since 2016. Her expertise includes 3D modeling, architectural design, photogrammetry, animation, and compositing. She contributed to the "Bologna Porticoes for a UNESCO candidacy" project, the "MICE-Museum of industrial ceramics of Civita Castellana," the educational Computer Graphic short "Il piccolo Masaccio e le Terre Nuove." For the Virtual Studiolo she will contribute to the entire process of 3D modeling from photogrammetry to initial guidelines for image acquisition, to the correction of images and 3D construction. She also assists with computer graphics tasks.

**Beatrice Chiavarini** holds a Masters in Architecture and has collaborated with Cineca since 2016. Her specialties include 3D modeling, 3D Web app development, architectural design, and animation. She contributed to "MUVI – Virtual Museum of Daily Life, the 1930s section"; "Lucio Saffaro Foundation, Dodecaedro Paolense"; and the "Lapidario di Santo Stefano" projects. For the Virtual Studiolo, she will assist with the design phase, development and implementation of interactions for the 3D web application, and with computer graphics tasks.

#### **Art Historical Advisors**

**Molly Bourne** (PhD History of Art, Harvard 1997) is Lecturer in Art History and Director of the graduate program at Syracuse University in Florence, a principal program for the education of art historical professionals specialized in the Italian Renaissance. She is the author of a major study of the artistic patronage of Isabella d'Este's husband, *Francesco II Gonzaga: The Soldier Prince as Patron* (2008) and has published numerous essays on the collecting of this dynastic couple. (b) (6). Bourne will serve as an art historical and architectural consultant on the Ducal Palace of Mantua and Isabella's *studiolo* and will provide feedback via Skype, email, and personal meetings at several stages of the project as it progresses.

**Stephen Campbell** (PhD, History of Art, Johns Hopkins 1993) is Professor of Art History at the Johns Hopkins University and is the foremost living authority on the studiolo of Isabella d'Este. His 2006 book, *The Cabinet of Eros: Renaissance Mythological Painting and the Studiolo of Isabella d'Este* (Yale UP) is a definitive study. He is author also of *Cosmé Tura of Ferrara. Style, Politics, and the Renaissance City 1450-1495* (1997); co-author of the textbook, *Italian Renaissance Art* (2012); and co-editor of *Cosmé Tura: Painting and Design in Renaissance Ferrara* (2002) and of *Artistic Exchange and Cultural Translation in the Italian Renaissance City* (2004). His most recent book addresses artistic geographies in the Renaissance. Campbell will serve as the principal consultant on Isabella d'Este's studiolo paintings and sculptures. He will provide feedback via Skype, email, and (if schedules coincide) personal meetings at several stages of the project as it progresses.



## Humanities Initiatives BUDGET FORM

OMB No 3136-0134  
Expires 6/30/2018

Applicant Institution: *The Regents of the University of California, Santa Cruz*

Project Director: *Deanna Shemek*

Project Grant Period: *01/01/2019-06/30/2020*

| Item  | Computational Details/Notes   |                 | Year 1<br>01/01/2019-<br>12/31/2019 |                 | Year 2<br>01/01/2020-<br>06/30/2020 |                 | Year 3 | Project Total |
|---|---|-----------------|-------------------------------------|-----------------|-------------------------------------|-----------------|--------|---------------|
| <b>1. Salaries &amp; Wages:</b><br><b>Name and Title</b><br><i>(Including stipends for faculty participants—for personnel <u>employed by applicant Institution</u>)</i> | Institutional base salary (IBS) for faculty or full-time equivalent (FTE) for non-faculty | % of IBS or FTE |                                     | % of IBS or FTE |                                     | % of IBS or FTE |        |               |
| Deanna Shemek   | Summer Salary = (b) (6) year 2  |                 |                                     | 100%            | (b) (6)                             |                 |        | (b) (6)       |
| <b>2. Fringe Benefits</b>   |   |                 |                                     |                 |                                     |                 |        |               |
| Deanna Shemek   |   |                 |                                     | 13.50%          | (b) (6)                             |                 |        | (b) (6)       |
| <b>3. Consultant Fees and Honoraria</b><br><i>(personnel <u>not employed by applicant Institution</u>)</i>  |   |                 |                                     |                 |                                     |                 |        |               |
| CINECA - Freelance  |   |                 | (b) (6)                             |                 | (b) (6)                             |                 |        | (b) (6)       |
| CINECA - Sub  |   |                 | (b) (6)                             |                 | (b) (6)                             |                 |        | (b) (6)       |
| <b>4. Travel</b> <i>(Include Project Directors' Meeting in Washington, DC)</i>  |   |                 |                                     |                 |                                     |                 |        |               |
| Project Directors' Meeting, DC  |   |                 | \$1,000                             |                 |                                     |                 |        | \$1,000       |
| PI and Co-PI to Cineca (Italy)  |   |                 | \$7,680                             |                 |                                     |                 |        | \$7,680       |
| Co-PI to PI's institution for demo and feedback meetings  |   |                 | \$700                               |                 |                                     |                 |        | \$700         |
| PI and Co-PI to Cineca (Italy)  |   |                 |                                     |                 | \$7,680                             |                 |        | \$7,680       |
| PI to Co-PI's institution for demo and feedback meetings  |   |                 |                                     |                 | \$700                               |                 |        | \$700         |
| PI travel to Italy for research in museums and writing (14 dasy)  |   |                 |                                     |                 | \$6,792                             |                 |        | \$6,792       |
|   |   |                 |                                     |                 |                                     |                 |        | \$0           |
| <b>5. Supplies &amp; Materials</b>  |   |                 |                                     |                 |                                     |                 |        | \$0           |
|   |   |                 |                                     |                 |                                     |                 |        | \$0           |
| <b>6. Services</b>  |   |                 |                                     |                 |                                     |                 |        |               |
| License fee   | For publishing 3D environments  |                 | \$300                               |                 |                                     |                 |        | \$300         |
| <b>7. Other Costs</b>   |   |                 |                                     |                 |                                     |                 |        | \$0           |
|   |   |                 |                                     |                 |                                     |                 |        | \$0           |
| <b>7a. Total Direct Costs (the sum of items 1-7)</b>  |   |                 | \$38,347                            |                 | \$50,886                            |                 | \$0    | \$89,233      |
| <b>8. Indirect Costs</b>  |   |                 | \$5,254                             |                 | \$5,410                             |                 | \$0    | \$10,664      |
| <b>9. Total Project Costs (the sum of items 8 and 9—Direct and Indirect Costs—for the entire project)</b>   |   |                 |                                     |                 |                                     |                 |        | \$99,897      |
| <b>10. Project Funding</b>  |   |                 |                                     |                 |                                     |                 |        | \$0           |
|   | <b>a. Requested from NEH</b>  |                 |                                     |                 |                                     |                 |        | \$0           |
|   | <b>TOTAL REQUESTED FROM NEH:</b>  |                 |                                     |                 |                                     |                 |        | \$99,897      |
|   | <b>b. Voluntary Cost Sharing</b>  |                 |                                     |                 |                                     |                 |        | \$0           |
|   |   |                 |                                     |                 |                                     |                 |        | \$0           |
|   |   |                 |                                     |                 |                                     |                 |        | \$0           |
|   | <b>TOTAL COST SHARING:</b>  |                 |                                     |                 |                                     |                 |        | \$0           |
| <b>11. Total Project Funding</b>  |   |                 |                                     |                 |                                     |                 |        | \$99,897      |



## **5. Budget Narrative**

A little less than half of our budget is dedicated to the technical production of the project, for which the Cineca subcontractors are working below their normal salaries. Their budget is calculated in monthly increments and includes the Value Added Tax (VAT) that is standard for European goods and services. The freelance workers are junior colleagues affiliated with the project through Cineca but are not regular Cineca employees, hence they will be paid directly by the grant rather than as subcontractors. Because face-to-face collaborations have been crucial factors in our productivity thus far, we have dedicated a significant part of the budget to travel for the PI and Co-PI to meet twice, at different points in the project, in Italy at the Cineca headquarters with our team there. Travel between the two Co-PIs' institutions has also been included to enable us to present our progress for feedback to relevant scholarly communities in each place. An additional travel expense is calculated for the PI alone in the ending weeks of the grant period, in order to do final real/virtual comparisons and analytical consultations with the Cineca team, and to draft the final white paper/research article in dialogue with them. There is a standard licensing fee for publishing 3D environments online. We have estimated this fee amount based on Cineca experience. Finally, a month of summer salary has been added for me as PI. I will be working that month primarily on research for the interactive map and consulting the relevant European museums about next phases of the project.

### Appendix 1 Main Deliverables and Related Work Packages

| Deliverable No. | Deliverable name                                | Work Package No. | Delivery Date  |
|-----------------|---|------------------|----------------|
| Report 1        | First review meeting and project status report  | Work Package 1   | Month 5        |
| Deliverable 1   | Virtual Studiolo first private release          | Work Package 2   | Month 5        |
| Report 2        | Second review meeting and project status report | Work Package 1   | Month 10 or 11 |
| Deliverable 2   | Virtual Studiolo second private release         | Work Package 4   | Month 12       |
| Report 3        | Third review meeting and project status report  | Work Package 1   | Month 13       |
| Deliverable 3   | Virtual Studiolo HMD version release            | Work Package 5   | Month 15       |
| Deliverable 4   | Virtual Studiolo public release                 | Work Package 4   | Month 18       |
| Publication 1   | Final publication                               | Work Package 1   | Month 18       |

**Appendix 2 Budget Justification Details**

## US team Expenses

|  |         |
|--|---------|
| Summer month + fringe (PI Shemek)  | (b) (6) |
| License fee for publishing 3D environments (no download)   | 300     |
| Year 1 travel and per diem mandatory meeting (PI) at NEH headquarters (2 days)   | 1,000   |
| Year 1 travel @ 2200/person and per diem @328/day for 2 travelers (PI Shemek and co-PI MacNeil) to Cineca (Italy) for organizational meeting and museum research (5 days)  | 7,680   |
| Travel for MacNeil to UCSC for Visualization Wall public event and feedback collection (3-4 days, lodging provided by Shemek)  | 700     |
| Year 2 travel @ 2200/person and per diem @ 328/day for consultation and evaluation at Cineca (Italy) for 2 travelers (Shemek, MacNeil ), 5 days  | 7,680   |
| Year 2 Travel and per diem for Shemek (Santa Cruz to UNC Chapel Hill) for presentation of Milestones 1 and 2 and feedback collection from BeAm Maker Space and Medieval Renaissance research group (3 days, lodging hosted by Co-PI) | 700     |
| Year 2 travel @ 2200 and per diem @ 328 for 1 traveler (Shemek) to Italy for research in museums and with Cineca team (14 days)  | 6,792   |
| <b>Total US team</b>   | (b) (6) |

## Italian subcontractors and collaborators

|   |         |
|---|---------|
| Daniele De Luca 9 weeks (VAT included)  | (b) (6) |
| Silvano Imboden 9 weeks (VAT included)  |         |
| Antonella Guidazzoli / Maria Chiara Liguori/ Giovanni Bellavia 6 weeks (VAT included) |         |
| Travel for team internal to Italy   |         |
| <b>Total Cineca subcontractors</b>  |         |
| Beatrice Chiavarini 3 months (VAT included)   |         |
| Federica Farroni 3 months (VAT included)  |         |
| Total freelance collaborators (to be paid directly by UC Santa Cruz)                  |         |
| <b>Total Cineca and Freelance</b>   |         |

| Virtual Studiolo Work Plan |  |  | M1  | M2  | M3  | M4  | M5  | M6  | M7  | M8  | M9  | M10 | M11 | M12 | M13 | M14 | M15 | M16 | M17 | M18 |
|----------------------------|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                            |  |  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| Human resources            |  |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Tasks                      | Work Package 1 - Technical Management and Research Coordination                                |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.1                       | Administrative and financial activities  | UCSC and UNC   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.5                       | Data management plan and back up implementation  | Silvano Imboden and UCSC and UNC technicians                                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.2                       | Technical Management of the project  | Antonella Guidazzoli; Silvano Imboden  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.3                       | Research coordination  | Deanna Shemek; Anne MacNeil; Antonella Guidazzoli; Maria Chiara Liguori      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.4                       | Organizational meetings and research/Italy   | Deanna Shemek; Anne MacNeil  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T1.6                       | Research in museums and meetings at Cineca (Italy) and final report evaluating project results | Deanna Shemek  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | P1  |
| T1.7                       | Research planning for future actions   | Deanna Shemek; Anne MacNeil  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Tasks                      | Work Package 2 - The Virtual Studiolo Space Cycle 1 (Milestone 1)                              |  |     |     |     |     | D1  |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.1                       | Asset repository Set up  | Silvano Imboden  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.2                       | Web site update and development of the interactive map   | Deanna Shemek; Anne MacNeil  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.3                       | User requirements analysis   | Daniele De Luca; Giovanni Bellavia   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.4                       | Additional photogrammetry of studiolo elements   | Daniele De Luca; Beatrice Chiavarini; Federica Farroni; Maria Chiara Liguori |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.5                       | 3D Virtual Studiolo models optimization  | Daniele De Luca; Beatrice Chiavarini; Federica Farroni                       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.6                       | Visual interface Design phase 1  | Silvano Imboden; Daniele De Luca   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.7                       | Interaction Design: Floor phase 1  | Daniele De Luca  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.8                       | Interaction Design: Navigation phase 1   | Silvano Imboden; Daniele De Luca   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.9                       | Interaction Design: Lighting phase 1   | Silvano Imboden; Daniele De Luca   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.10                      | Visual interface Implementation phase 1  | Silvano Imboden; Beatrice Chiavarini   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.11                      | Floor Implementation phase 1   | Federica Farroni   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.12                      | Navigation Implementation phase 1  | Silvano Imboden; Beatrice Chiavarini   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.13                      | Lighting Implementation phase 1  | Silvano Imboden; Beatrice Chiavarini   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.14                      | User experience analysis phase 1   | Giovanni Bellavia; Maria Chiara Liguori                                      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.15                      | Researchers' Virtual Studiolo Testing phase  | Deanna Shemek; Anne MacNeil  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T2.16                      | Researchers' Virtual Studiolo Items choice   | Deanna Shemek; Anne MacNeil  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Tasks                      | Work Package 3 - The Virtual Studiolo STATUETTES (Milestone 2)                                 |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T3.1                       | Intarsia cabinets reconstruction (at least 1)  | Daniele De Luca; Federica Farroni  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T3.2                       | KHM Photographs Analysis and Correction  | Daniele De Luca; Federica Farroni  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T3.3                       | 3D Reconstruction (item 1)   | Daniele De Luca; Federica Farroni  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T3.4                       | 3D Reconstruction (item 2)   | Daniele De Luca; Federica Farroni  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| T3.5                       | 3D Reconstruction (item 3)   | Daniele De Luca; Federica Farroni  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Tasks                      | Work Package 4 - The Virtual Studiolo Space Cycle (Milestones 1 and 2)                         |  |     |     |     |     |     |     |     |     |     |     |     | D2  |     |     |     |     |     | D4  |



|   |  |   |
|---|--|---|
| T4.1  | Feedback analysis from researchers                           | Silvano Imboden; Daniele De Luca,<br>Antonella Guidazzoli, Maria Chiara<br>Liguori, Giovanni Bellavia |
| T4.2  | Interaction Design: time bar                                 | Silvano Imboden   |
| T4.3  | Measurements tool Design                                     | Silvano Imboden; Daniele De Luca  |
| T4.4  | Object interaction implementation (cabinet)                  | Silvano Imboden; Beatrice Chiavarini  |
| T4.5  | Lighting Implementation lighting phase 2                     | Silvano Imboden; Beatrice Chiavarini  |
| T4.6  | Measurements tool Implementation                             | Silvano Imboden; Daniele De Luca  |
| T4.7  | Time bar implementation                                      | Silvano Imboden; Daniele De Luca  |
| T4.8  | KHM objects insertion  | Silvano Imboden; Beatrice Chiavarini  |
| T4.9  | User experience analysis phase 2                             | Giovanni Bellavia, Maria Chiara Liguori   |
| T4.10   | Virtual Studiolo public version implementation               | Silvano Imboden; Daniele De Luca;<br>Beatrice Chiavarini  |
| Work Package 5 Virtual Studiolo for HMD (Milestone 1) |  | D3  |
| T5.1  | Virtual Studiolo Head Mounted Display Design                 | Silvano Imboden; Daniele De Luca  |
| T5.2  | Virtual Studiolo Head Mounted Display implementation phase 1 | Silvano Imboden; Daniele De Luca;<br>Beatrice Chiavarini  |
| T5.3  | Virtual Studiolo Head Mounted Display Testing                | Silvano Imboden; Daniele De Luca,<br>Antonella Guidazzoli, Maria Chiara<br>Liguori, Giovanni Bellavia |
| T5.4  | Virtual Studiolo Head Mounted Display final implementation   | Silvano Imboden; Daniele De Luca;<br>Beatrice Chiavarini  |
|   |  |   |
|   |  |   |
| Main Deliverables                                     |  |   |
| Report 1  | First review meeting and project status report               |   |
| D1  | Virtual Studiolo first private release                       |   |
| Report 2  | Second review meeting and project status report              |   |
| D2  | Virtual Studiolo second private release                      |   |
| Report 3  | Third review meeting and project status report               |   |
| D3  | Virtual Studiolo HMD version release                         |   |
| D4  | Virtual Studiolo public release                              |   |
| P1  | Final publication  |   |

#### Appendix 4 Screen Shots

4a) Empty *studiolo* today (IDEA Music/a "Ad tempo taci")



4b) Simulated floor (IDEA Virtual Studiolo demo video)



4c) Actual *studiolo* ceiling (IDEA Art/e Virtual Studiolo demo video)



## Appendix 5 Future Work Plans

### Milestone 3. The intarsia cabinets, “beyond the walls.”

- Enable user interaction with at least one of the intarsia cabinets, which are decorated also on the interiors.
- Seek permission to move fabric away from the *grotta* walls to study the niches beneath and reconstruct them or to use ultraviolet light photography for this purpose.
- **Research objective:** Integrate the decorative program on the inside of the doors into our understanding of the *studiolo*. Increase experience of the *studiolo*’s dimensionality.

### Milestone 4. The paintings.

- Add the paintings to the Virtual Studiolo walls. Our aim is to work with the Louvre and Factum to achieve digital recordings of unprecedented quality. Risk: Barring this possibility, we will work with the Louvre’s existing online images.
- Add the gradual arrival of paintings as they were commissioned to the timeslider.
- Add a color analysis tool for sorting and matching among the paintings and other objects.
- Begin creating videos about the paintings and illustrating the utility of the Virtual Studiolo tools.
- Add a tool like Prezi or Sketchfab to allow users to create narratives, lessons, and personally curated tours through the Virtual Studiolo.
- **Research objectives:** Experience the paintings in the compressed environment of the densely furnished *studiolo*, consider different narrative agendas, create new “stories” within and about the *studiolo*. Acquire deeper knowledge of how color, texture, and form functioned in the *studiolo*.

### Milestone 5. Cloud services (manual annotation capacity for users).

- Provide a cloud login for users who wish to make personal annotations that may be saved/loaded/searched in the cloud space.
- Add our own annotations linking the Virtual Studiolo to other IDEA projects (e.g. links to relevant documents in IDEA Letters, links to musical examples in IDEA Music).
- **Research objective:** Sharing knowledge and connecting the Virtual Studiolo to documentary and multidisciplinary sources.

### Milestone 6. Music concert in the Virtual Studiolo.

- Building on IDEA Music/a, hold a concert event within the Virtual Studiolo.
- **Research objective:** Recover the *studiolo* as a multi-media space for acoustic performance and sounding artworks.

## Appendix 6. Short CVs of PI and Co-PI



Curriculum Vitae  
Deanna Shemek  
Professor of Literature  
University of California, Santa Cruz

**EDUCATION**

1988 Ph.D., Italian, The Johns Hopkins University, Baltimore, MD. Department of Hispanic and Italian Studies

**SELECTED WORK IN PROGRESS**

*In Continuous Expectation: Isabella d'Este's Reign of Letters* (monograph).

Co-director, Isabella d'Este Archive <http://isabelladeste.web.unc.edu>

"Renaissance Remix: Isabella d'Este Virtual Studiolo" (with Antonella Guidazzoli, Maria Chiara Liguori, Giovanni Bellavia, Daniele De Luca, Luigi Verri, and Silvano Imboden). *DHQ: Digital Humanities Quarterly*. Accepted pending revisions.

**SELECTED PUBLICATIONS**

**Digital**

- 2016 Producer, Isabella d'Este / Virtual Studiolo [Video](#).  
2013- Co-Director, *IDEA: Isabella d'Este Archive*, open-access online resource for study of Italian Renaissance. <http://isabelladeste.web.unc.edu>.  
2013- PI, IDEA: Isabella d'Este Archive Documents Platform  
[http://isabelladeste.ucsc.edu/?page\\_id=1658](http://isabelladeste.ucsc.edu/?page_id=1658)

**Books**

- 2016 *Isabella d'Este: Selected Letters*. Toronto and Tempe AZ: Iter Academic Press and Arizona Center for Medieval and Renaissance Studies. In press.  
2008 *Writing Relations: American Scholars in Italian Archives*. Edited by Deanna Shemek and Michael Wyatt Olschki: Florence.  
2005 *Phaethon's Children: The Este Court and its Culture in Early Modern Italy*. Edited by Dennis Looney and Deanna Shemek. Tempe: Medieval and Renaissance Texts and Studies.  
1998 *Ladies Errant: Wayward Women and Social Order in Early Modern Italy*. Durham: Duke University Press.

**Selected Essays**

- 2017 "Renaissance Princess, Digital New World: Isabella d'Este Archive." *Early Modern Women* 11.2: 115-25.  
2014 "Verse" in *The Cambridge Companion to the Italian Renaissance*. Edited by Michael Wyatt. Cambridge: Cambridge University Press. 179-201.  
2014 "Laura Terracina," in *Liriche del Cinquecento*, edited by Monica Farnetti and Laura Fortini. Rome: Iacobelli. 170-98.  
2013 "Doing and Undoing: Boccaccio's Feminism," in *Boccaccio: A Critical Guide to the Complete Works*. Edited by Victoria Kirkham, Michael Sherberg, and Janet Smarr. Chicago: University of Chicago Press. 195-204.  
2008 "Mendacious Missives: Isabella d'Este's Epistolary Theater," in *Writing Relations: American Scholars in Italian Archives*. Edited by Deanna Shemek and Michael Wyatt. Florence: Olschki. 71-86.  
2005 "The Collector's Cabinet: Lodovico Domenichi's Gallery of Women," in *Strong Voices, Weak Histories: Early Women Writers and Canons in England, France, and Italy*. Edited by Pamela Benson and Victoria Kirkham. Ann Arbor: University of Michigan Press. 239-62.

- 2005 "Isabella d'Este and the Properties of Persuasion," in *Form and Persuasion in Early Modern Women's Letters Across Europe*. Edited by Ann Crabb and Jane Couchman. Brookfield, VT: Ashgate. 123-40.

#### RELEVANT FELLOWSHIPS, GRANTS, AWARDS

- 2017 [Online Jury Award](#) for Isabella d'Este / Virtual Studiolo Video, Future Film Festival: International Festival of Cinema Animation and New Technologies. 2-7 May.
- 2017 PI, UC Humanities Research Institute, UC Irvine UCHRI Multi-Campus Faculty Working Group, for Isabella d'Este Virtual Studiolo: 13,500.
- 2016 PI, Samuel H. Kress Foundation Digital Resources Grant, for proof-of-concept demonstration video of Isabella d'Este Virtual Studiolo: \$11,165.
- 2016 PI, Lila Acheson Wallace - Reader's Digest Publications Subsidy at Villa I Tatti, for *Isabella d'Este: Selected Letters*: \$5000.
- 2014-2017 Gary D. Licker Memorial Chair, Cowell College: \$24,000.
- 2013-2014 Co-Principal Investigator (Co-PI) with Elizabeth Alice Honig (UC Berkeley), UC Humanities Research Institute, UC Irvine, for study group "Early Modern Patterns."
- 2013-2013 PI, UC Humanities Research Institute, UC Irvine, for convening of Residential Research Group "Digital Princess."
- 2013-2013 PI, UCSC Board Opportunity Funds (Board of Trustees) for *IDEA: Isabella d'Este Archive*: \$9,485.
- 2012-2013 PI, Gladys Krieble Delmas Foundation Trustees, for seed funding of *IDEA: Isabella d'Este Archive*: \$5,000.
- 2012-2013 PI, UCSC Committee on Research Special Research Grant, for *IDEA: Isabella d'Este Archive*: \$5,000.
- 2012-2013 Co-PI with Daniela Ferrari (Director, Mantuan State Archives), Italian Ministry of Cultural Patrimony and Tourism (MiBACT), for digitizing correspondence of Isabella d'Este, Marchesa of Mantua: \$30,000.

#### Relevant Invited Talks and Presentations

- 2014- Presentations and Workshops on *IDEA: Isabella d'Este Archive*  
<http://isabelladeste.web.unc.edu>
- Monash University, Melbourne, Australia. 25 August 2017.
  - University of Sydney, Medieval and Early Modern Center. 23 August 2017.
  - Amici del Palazzo Te, Mantua, Church of the Madonna della Vittoria (with Daniela Ferrari). 6 July 2017.
  - University of Oregon Department of Romance Languages. Eugene, Oregon 1 May 2017.
  - University of Alabama Digitorium Digital Humanities Conference (Plenary Presentation with Anne Macneil). 3 March 2017.
  - University of California, Berkeley Department of Italian. 16 February 2016.
  - New York University Casa Italiana. 12 February 2016.
  - "Renaissance Princess, Digital New World: Isabella d'Este Online." SSEMW Plenary, Sixteenth-Century Studies Conference. Vancouver BC, 24 October.
  - University of California, Berkeley Early Modern Patterns Digital Group. 5 April 2014.
- 2017 "The Inkwell and the State: Isabella d'Este as a Master of the Letter."
- University of California, Merced. 20 September.
  - Melbourne University. Melbourne, Australia. 25 August.



## ANNE MACNEIL, Curriculum Vitae

### Current and Past Positions

- 2005-present Associate Professor, Department of Music, University of North Carolina, Chapel Hill.  
2008-present Adjunct Associate Professor, Department of English and Comparative Literatures, UNC.  
1999-2005 Assistant Professor, Department of Music, UNC.  
1997-1999 Assistant Professor, School of Music, University of Texas, Austin.  
2012-present Co-Director, *IDEA: Isabella d'Este Archive* (an international consortium).

### Education

- 1994 PhD, History and Theory of Music, University of Chicago.  
"Music and the life and work of Isabella Andreini." Howard Mayer Brown, advisor.  
1985 MA, Music History, Eastman School of Music.  
1981 BMus, Vocal Performance, Ithaca College.

### Awards and Honors

- 2017-2018 Andrew W. Mellon/NEH Digital Editions Fellowship.  
2015-2016 American Council of Learned Societies Digital Innovations Fellowship.  
2014-2015 Edwin H. and Myrtice Logue Yoder Faculty Fellowship, IAH/DIL, UNC.  
2014-2015 Dorothy Ford Wiley Grant to organize an international symposium, UNC.  
2009 Chapman Family Fellowship for Excellence in Teaching, UNC.  
2006-2007 Phillip and Ruth Hettelman Prize for Artistic and Scholarly Achievement, UNC.  
2004-2005 American Research Fellowship, American Association of University Women.  
1997, 1992 Research Fellowship, Gladys Krieble Delmas Foundation.  
1995, 1990 Summer Seminar Fellowship, National Endowment for the Humanities.  
1992-1993 AMS 50 Dissertation Fellowship, American Musicological Society.  
1991-1992 Rome Prize, American Academy in Rome.

### Digital Humanities

- 2017-2018 Principal Investigator and Database Designer, *Italian Songs from the Time of Christopher Columbus*. A digital critical edition featuring music as a sounding work of art.  
2016-2017 Partnership with the North Carolina Museum of Art. *The Glory of Venice* exhibition.  
2015-2016 Principal Investigator and Database Designer, *Mapping Secrets*.  
A correspondence network project that maps secretarial duplications and administrative record-keeping for Isabella d'Este's (1474-1539) correspondence of approx. 32,000 letters.  
2015 Producer & Director, *Ad tempo taci: Songs for Isabella d'Este* (film).  
2015- Co-Principal Investigator, *The Virtual Studiolo*.  
A 4D simulation of the art, architecture, & music of Isabella d'Este's *studiolo* and *grotta*.  
2015 Director and Organizer, *Big Data for Intimate Spaces*, Dorothy Ford Wiley Compact Seminar, University of North Carolina, Chapel Hill, NC. Feb. 26-30.  
2014-2015 Principal Investigator and Database Designer, *POPP: Parsing Ottaviano Petrucci's Prints* <https://poppreperatory.web.unc.edu>  
A DH Press project for research of 16<sup>th</sup>-century Italian songs (*frottole*) published by the first music printer. Site is designed for on-going collaboration and development.

### Publications and Presentations

- 2018 "Songs for Isabella d'Este," in *Uncovering the Music of Early European Women*, edited by Claire Fontijn. New York: Routledge. Accepted for publication, July 2017.  
Nov. 2017 "Italian Songs from the Time of Christopher Columbus." Wellesley College.  
June 2017 Program notes for *Il labirinto di Isabella d'Este*. Marco Beasley & ensemble.  
<http://www.marcobeasley.it/il-labirinto-di-isabella.html>

- Feb. 2017 "IDEA: Isabella d'Este Archive." Keynote address with Deanna Shemek, *Digitarium 2017*. University of Alabama, Tuscaloosa.
- Feb. 2017 "The Glory of Venice: Music & Art of the Venetian Renaissance." *Spectrum Concert*. University of North Carolina, Chapel Hill.
- 2017 "Commedia dell'Arte and Music, 1550-1800," in *Commedia dell'Arte in Context*, edited by Christopher Balme, et al., 167-76. Cambridge (UK): Cambridge University Press.
- May 2016 Lecture. "Ad tempo taci: Isabella d'Este's Apartments as Performative Space." Fondazione Giorgio Cini, Venice, Italy.
- Apr. 2016 Lecture. "A New Breed of Critical Edition: The Role of Digital Humanities in Transforming Music Scholarship." University of California, Santa Cruz.
- Apr. 2015 Lecture. "A Digital Humanities Demonstration: Parsing Ottaviano Petrucci's Prints and the Isabella d'Este Archive." Dartmouth University.
- 2015 "Celestial Sirens of the Commedia dell'Arte Stage," in *A Companion to Commedia dell'Arte*, edited by Olly Crick and Judith Chaffee, 246-54. New York: Routledge, 2015.
- Oct. 2015 "Parsing Ottaviano Petrucci's Prints," DH poster. Society for Sixteenth-Century Studies annual conference, Vancouver, Canada.
- Feb. 2015 Lecture. "Parsing Ottaviano Petrucci's Prints: Proof of Concept." University of Iowa.
- Mar. 2014 "Music for IDEA: Isabella d'Este Archive." Renaissance Society of America, New York.
- Nov. 2013 "The Way-Back Machine: Digital Tools for Study of the Distant Past." Installation of the *Virtual Paul's Cross Project*. North Carolina State University.
- 2013 "Opera and Commedia dell'Arte," in *Glyndebourne Opera Festival 2013*, ed. Karen Anderson, 36-8. East Sussex: Glyndebourne Productions Ltd.
- May 2013 "Isabella d'Este & Music." University of California Humanities Research Institute.
- July 2012 "Monsignor Antonio Ceruto and Music Making in Mantua in the 1560s." International Musicological Society, Rome, Italy.
- Apr. 2011 "Musica Secreta." Three lectures for the Howard Mayer Brown Memorial Concerts. The Newberry Consort, directed by David Douglass and Ellen Hargis. Chicago, IL.
- 2012 "Music for Margherita Farnese," in *Sleuthing the Muse*, edited by Kristine Forney and Jeremy L. Smith, 253-70. NY: Pendragon Press.
- Oct. 2009 "On Jacob's Boat: Pleasure Cruising in 16th-Century Mantua." Furst Forum Lecture, Department of English and Comparative Literatures, UNC.
- 2005 *Selected Poems of Isabella Andreini*, ed. and intro. Anne MacNeil; trans. James Wyatt Cook. Lanham MD: Scarecrow Press.
- Dec. 2005 "Il rapporto entro Claudio Monteverdi e la famiglia Andreini, comici dell'arte." Accademia Nazionale Virgiliana and Istituto Internazionale per l'Opera e la Poesia. Mantua, Italy.
- 2004 "Dynastic Iconography in Giovan Battista Andreini's *La Centaura* (1622)." In *Music Observed: Studies in Memory of William C. Holmes*, ed. Colleen Reardon and Susan Parisi, 257-74. Warren, MI: Harmonie Press.
- 2003 *Music and Women of the Commedia dell'Arte in the Late Sixteenth Century*. Oxford: Oxford University Press.
- 2002 "The Nature of Commitment: Vincenzo Gonzaga's Patronage Strategies in the Wake of the Fall of Ferrara," *Renaissance Studies* 16 (2002): 392-403.
- 1999 "Weeping at the Water's Edge," *Early Music* 27 (1999): 406-18.
- 1999 "A Portrait of the Artist as a Young Woman," *Musical Quarterly* 83 (1999): 247-79.

#### Other Relevant Professional Activities and Accomplishments

Italian, paleography (language and music), html, database design, WordPress, Photoshop, vocal performance, performance practices, archival studies.

## **7. Letters of Commitment and Support**



UNC  
COLLEGE OF  
ARTS & SCIENCES

THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

DEPARTMENT OF MUSIC

CAMPUS BOX 3320  
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28 May 2018

To whom it may concern,

This letter is to confirm my enthusiastic participation in the *IDEA Virtual Studiolo* project (Prof. Deanna Shemek, Principal Investigator). I am a music historian specializing in sixteenth-century Italy, with particular expertise in historical performance studies and digital humanities. Deanna Shemek and I, together with Dr. Daniela Ferrari (formerly Director of the State Archives in Mantua, Italy), serve as Co-Directors of the multi-project digital environment *IDEA: Isabella d'Este Archive*. As of today, *IDEA* comprises six projects that focus on the diverse areas of Letters, Paleography, Music, Ceramics, Bibliography, and Correspondence Network Mapping (all projects may be accessed from our home site, <http://isabelladeste.web.unc.edu>). Please note that the Network Mapping project is currently in development.

Across projects, we work in collaboration with the University of California, Santa Cruz; the University of North Carolina, Chapel Hill; the Università degli Studi di Teramo; the Italian Ministry for Arts, Cultural Heritage, and Tourism (MiBACT); the National Center for Supercomputing Applications (NCSA) at the University of Illinois, Urbana-Champaign; ZefiroFilm; and the Inter-University Supercomputer Center (CINECA) in Bologna, Italy. Various projects also have contractual agreements with the Bayerische Staatsbibliothek in Munich and the Oesterreichische Nationalbibliothek in Vienna.

Individual researchers working in *IDEA* include faculty and graduate students not only from Deanna Shemek's and my home universities but also from the University of Indiana, Bloomington; Cerritos College; Pasadena City College; the Università del Sacro Cuore in Milan; Syracuse University in Florence; and Johns Hopkins. Primary sources of funding for *IDEA* projects include the Andrew W. Mellon Foundation; the National Endowment for the Humanities; the Gladys Krieble Delmas Foundation; the Italian Ministry for Arts, Cultural Heritage, and Tourism; the American Council of Learned Societies; the Samuel H. Kress Foundation; the University of California, Santa Cruz, and the University of North Carolina, Chapel Hill.

Across *IDEA*, we are devoted to the development of interactive projects that encourage users not only to explore the rich, interdisciplinary comparative history of the Italian Renaissance, but also to create new research utilizing both traditional formats and new tools that we develop. As a music historian, I am particularly enthusiastic about our newest project in the *IDEA* environment, the *Virtual Studiolo*. You will know from our application narrative that the *Virtual Studiolo* project aims



to create virtual simulations of Isabella d'Este's apartments in the Ducal Palace in Mantua, Italy and to offer users the opportunity to re-populate these rooms with the artworks that once dwelled there. Users will be able to inspect individual artworks in 3D, to move artworks around the rooms in order to experiment with developing narrative strategies, and to curate exhibits of Isabella d'Este's spectacular collections. Even in the making of the teaser video for this project new conceptualizations of the space have become apparent. The virtual installation of the floor tiles, which resonates with the ceiling decoration to create a geometric saturation of the space that highlights the shape of an octagon, suggests an attention to the study of proportions and a potential alignment with Luca Pacioli's influential treatise *De divina proportione*, illustrated by Leonardo da Vinci and printed in Venice in 1509.

Isabella d'Este's apartments are famous, even today. Every undergraduate music history and art history textbook contains a special section devoted to study of Isabella d'Este and her collections. Her voluminous correspondence, instructions for commissions, and negotiations for obtaining art objects – including musical instruments, poetry for musical setting, and music compositions written especially for her – survive intact at the State Archives and Municipal Library in Mantua, Italy and may be studied on our *IDEA Letter/e* site at <https://idealetters.web.unc.edu>. We are currently looking to add a new manuscript to this site, the so-called *Songbook of Isabella d'Este* (actually a book of poetry), a few pages of which are featured on the Google Arts and Culture site for the Biblioteca Teresiana in Mantua.

Other artworks known to have occupied her apartments include paintings by Andrea Mantegna, Pietro Perugino, Lorenzo Costa, and Antonio da Correggio; bronze sculptures by Antico; wood inlaid cabinets by Antonio and Paolo Mola; a marble statue by Michelangelo; and antiquities. In every medium, music-making is often depicted, and we are working in this project to bring these images to life. For example, the painting *Parnassus* by Andrea Mantegna that is one of the four large narrative paintings that graced the walls of Isabella's studiolo depicts a scene where the nine Muses perform a circle dance to the accompaniment of a musician playing a classical lyre. Imagine the wonder of the Muses stepping out of the painting to dance a *branle* in front of you to the accompaniment of a musician playing a dance song from Isabella's collections! In this case, the research comes from performances given for the Este family at its various festivities, from performance practice manuals, from recreations of Isabella's musical instruments utilizing historic methods of instrument construction, and from Isabella's correspondence with musicians and instrument makers. With the Virtual Studiolo project, we want to bring study of these rooms, this woman, and her artworks to as many people as we can – to involve students, faculty, and the general public in the collaborative work of exploration, imagination, and curation, and to offer quality experiences in these areas as freely and inexpensively as possible.

As a Co-Principal Investigator of the Virtual Studiolo project, my part is to conduct research regarding appropriate historical music, poetry, and performance practices; to work with musicians and recording personnel to create performances of music that has never before been recorded; to direct work in acoustic modeling of ambient

sound appropriate to the time period (defined by Isabella d'Este's lifetime, 1474-1539) and to the intimate, enclosed spaces of her apartments; to work with Deanna Shemek on an interactive map, and to contribute to the evaluation of technologies and features in the project. Much of this work is based on the initial photogrammetry and 3D modelling of the space. Because so much of this project involves discussion, brainstorming, evaluation, and group decision-making, our application includes travel to project meetings for various members of the research team. I am willing, and I have the support of my university, to travel twice to Italy and once to Santa Cruz during the term of the grant and to host Deanna Shemek's visit to Chapel Hill.

The spaces comprising Isabella d'Este's apartments, which are the focal point of the *Virtual Studiolo* project, may be seen in my 30-minute film, *Ad tempo taci: Songs for Isabella d'Este*, which may be found at <https://ideamusic.web.unc.edu/ad-tempo-taci/>. If you have any questions about the *Virtual Studiolo* project or about the *IDEA: Isabella d'Este Archive* environment as a whole, please do not hesitate to contact me.

Sincerely yours,

*Anne MacNeil*

3

Anne MacNeil, PhD, FAAR  
Department of Music  
University of North Carolina, Chapel Hill  
Chapel Hill, NC 27599-3320

Co-Director, [\*IDEA: Isabella d'Este Archive\*](#)  
macneil@unc.edu



May 11<sup>th</sup>, 2018

## Letter of participation to the Virtual Studiolo Project.

Via Magnanelli 6/3  
40033  
Casalecchio di Reno  
(Bologna)

tel. 051.6171.411  
fax 051.6131.198

[www.cineca.it](http://www.cineca.it)  
info@cineca.it

As a team leader of CINECA VisitLab (Visual Information Technology Laboratory), I acknowledge the cultural and scientific relevance of the Virtual Studiolo Project and, on behalf of my team, I declare us delighted and eager to participate in it. We have been working successfully with Professor Deanna Shemek, Professor Anne MacNeil, the Ducal Palace Museum in Mantua, the Kunsthistorisches Museum of Vienna, the Ceramics Museum of Faenza, and the broader team of scholarly advisors to the Virtual Studiolo Project since our first discussions in 2014.

I am particularly eager to continue in light of the results achieved up to now. In 2017, the Isabella d'Este Virtual Studiolo concept demonstration video (which was funded by the Samuel H. Kress Foundation) won the Online Jury Award in the Future Film Festival: International Festival of Cinema Animation and New Technologies and our photogrammetry of the historic studiolo space was featured in the popular Italian science television show, Superquark.

Our long experience in the field of Virtual Cultural Heritage projects leads us to consider our contribution as particularly suitable to the success of the Virtual Studiolo Project.

In our commitment to the project we will use our competencies and efforts to attain the technical aims described in the project. CINECA, as a non profit Consortium made up of 70 Italian universities, 4 Italian Research Institutions and the Italian Ministry of Education, is particularly suitable for creating a long term digital preservation of the Virtual Studiolo. Cineca also commits to hosting the Virtual Studiolo project on our server both during and after its development, and to sharing backups with both UCSC and UNC Chapel Hill.

The complexity of the project, with its manifold outputs, will be a challenging and exciting experience and we are looking forward to work on it in collaboration with such a multidisciplinary group of international experts.

Date May 11<sup>th</sup>, 2018

Full Name Antonella Guidazzoli

Position Head of CINECA VisitLab (Visual Information Technology Laboratory)

email a.guidazzoli@cineca.it

Signature

Stamp of institution:

  
**CINECA**  
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INTERUNIVERSITARIO  
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Registro Imprese CCIAA di  
Bologna n. 00317740371

**CINECA**

Casalecchio di Reno (BO), Italy

May 11<sup>th</sup>, 2018

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40033  
Casalecchio di Reno  
(Bologna)

tel. 051.6171.411  
fax 051.2130.217

[www.cineca.it](http://www.cineca.it)  
info@cineca.it

Letter of participation to the Virtual Studiolo Project.

As project-assistant at CINECA VisitLab (Visual Information Technology Laboratory), I declare my eagerness to participate in the Virtual Studiolo Project.

With my competencies both in History and in Virtual Cultural Heritage projects, I consider the Virtual Studiolo Project to be a deeply interesting opportunity.

Date May 11<sup>th</sup>, 2018

Full Name Maria Chiara Liguori

Position Project assistant CINECA VisitLab (Visual Information Technology Laboratory)

email m.liguori@cineca.it

Signature

*Maria Chiara Liguori*

Stamp of institution:

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Bologna n. 00317740371



## SYRACUSE UNIVERSITY FLORENCE

30 May 2018

To whom it may concern:

It is with great pleasure and enthusiasm that I confirm my participation as a consultant collaborator in the IDEA Virtual Studiolo project, co-directed by Deanna Shemek and Anne McNeil. As an art historian whose personal field of research and publication has been dedicated for the last twenty-plus years to the artistic patronage of the Gonzaga rulers of Mantua—especially the period of Isabella d'Este—I have long recognized the importance of Isabella's famous Studiolo as a unique source both for enriching our understanding of period practices of European (and specifically female) art collecting and display, as well as of the relationships between Europe and other parts of the world that were forged during Isabella's creation and population of these spaces with important paintings, art objects and *naturalia*. As the Marchioness of Mantua, for nearly half a century Isabella was an active participant in an extensive network that included the principal players in European politics and culture, interactions that are meticulously documented in her extensive and largely intact correspondence. Although the dispersal of Isabella's collection in the early seventeenth century has complicated our understanding of her Studiolo, the copious surviving documentary information combined with recent advances in digital technologies now enable us, from anywhere in the world, to employ accurate, three dimensional reproductions of the objects once displayed there to see, manipulate, and virtually experience their collective display in the still-extant spaces of the Ducal Palace where they were originally exhibited. The ability to create a "Virtual Studiolo" would be of inestimable value not only to academic historians of art, architecture, material culture, numismatics, and natural curiosities—all of which figured centrally in Isabella's collection—but would provide a flexible, multicultural, and effective learning tool for students in various disciplines from middle school through university and doctoral levels, as well as for a general public interested in history and culture.

I am thrilled that Prof. Deanna Shemek, with whom I have profitably collaborated for over twenty years on numerous research initiatives related to the Mantuan court, has spearheaded this important and innovative project. The initial results of IDEA's teamwork with the augmented and virtual reality specialists at CINECA to produce the prize-winning Virtual Studiolo video illustrate the value and potential of this project, demonstrating that the team possesses the necessary humanities-based and technical expertise to carry it forward in an appropriate and significant way. I look forward to continuing to work closely with Dr. Shemek and the rest of the IDEA team to collaborate on this enterprise as it develops into the next critical stages of realization. Please do not hesitate to contact me if I may offer any further information.

Yours sincerely,

Molly Bourne, Ph.D.

Faculty Associate and Coordinator, Florence Graduate Program in Renaissance Art  
mhbourne@syr.edu



**Department of the History of Art**

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arthist@jhu.edu

6/3/2018

I am writing in support of the NEH Digital Humanities grant application submitted by Deanna Shemek and the IDEA team that will enable the development of an interactive digital simulation of one of the most important Italian Renaissance spaces, the *camerini* of Isabella d'Este in Mantua. My enthusiasm for this project stems from my own twenty years of work on the artistic and literary patronage of this central figure, who was connected to almost all of the key cultural and political personalities of Italy between c.1490 and c.1530. In preparing my book *The Cabinet of Eros: Renaissance Mythological Painting and the Studiolo of Isabella d'Este* (New Haven and London, 2006) I spent many costly and laborious months in the archives of Mantua. I made some important discoveries, and – beyond my own special focus - became aware of just how rich a scholarly resource the forty or so years of correspondence might be: I also found myself wondering why no-one was seizing the initiative of making this material available on-line.

In 2013 I was delighted to participate in the early phases of discussion of the IDEA Virtual Studiolo project. With 28,000 letters now available online, the IDEA project is delivering on its promise of providing an extraordinary flagship scholarly resource. I am excited by the development of the virtual *studiolo* and *grotta* – the richly decorated rooms combining the function of personal study and proto-museum – and the surviving paintings and other art objects connected with the spaces. For teachers and scholars the reconstruction will offer untold advantages over a site visit to Isabella's apartment itself in its current state: it is difficult to hold teaching sessions there (I have tried) mainly due to spatial restrictions and the high volume of visitor numbers; the reconstruction will bring the space instead to the classroom. Moreover, it will afford a visualization of the room in its original state at the time of the death of its first owner, “re-installing” the famous and groundbreaking mythological paintings from the Louvre and a host of other objects and furnishings that have been removed in the intervening centuries. The user will also be guided through the various debates – arising from lacunae in the evidence about the ordering of the paintings, the marquetry, and the relationship between objects listed in the original inventories and actual surviving objects.

In short, this is a project of major importance destined to have an impact on several fields: history, art history, literary studies, musicology, and in a form which will provide scholars and students with new creative approaches to working with this material. Needless to say I will be more than happy to serve as a scholarly resource in any ways that may be useful to the project, whether by email or phone, and (circumstances permitting) in-person meetings.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "Stephen J. Campbell". The signature is written in a cursive, slightly slanted style.

(Stephen J. Campbell, Professor, History of Art).

## AGREEMENT OF COOPERATION

Made by and between

University of California, Santa Cruz  
Division of Humanities  
1156 High Street, Santa Cruz CA 95064  
USA  
("UC Santa Cruz")

and

KHM-Museumsverband  
represented by the Executive Board  
1010 Vienna, Burgring 5  
AUSTRIA  
("KHM")

### I.

UC Santa Cruz and KHM agree to cooperate and work together starting on 15 march 2018 by supporting the scientific project of UC Santa Cruz, "IDEA (Isabella d'Este Archive): Virtual Studiolo", led by Prof. Deanna Shemek, UC Santa Cruz and Professor Anne MacNeil, University of North Carolina, Chapel Hill, in collaboration with other scholars and with the historians, artists and computer engineers of VisitLab, a department of the CINECA supercomputing center in Bologna, Italy.

### II.

IDEA aims to create an interactive, immersive, 3D, online version of Isabella d'Este's famous studiolo in Corte Vecchia of the Ducal Palace of Mantua. In this environment, UC Santa Cruz plans to place 3D models of Isabella d'Este's paintings and other collectibles and therefore seeks permission to publish high-resolution 3D images of the following items held in the collections of KHM:

|         |         |           |
|---------|---------|-----------|
| KK 5726 | GG 1534 | MK 6833bb |
| KK 5767 | GG 83   |           |
| KK 5773 |         |           |
| KK 5987 |         |           |
| KK 5697 |         |           |
| KK 5545 |         |           |

### III.

KHM agrees to support the project by providing UC Santa Cruz and CINECA with high-resolution 3D images of the requested objects for the purpose of making 3D models. Insofar as 3D images of high resolution do not yet exist, KHM shall carry out the photogrammetric acquisition of the images at its own expense. In this case, UC Santa Cruz will bear only the costs of the object handling up to a maximum (total) amount of EUR 600 and will be invoiced accordingly by KHM. KHM will endeavour to provide the high-resolution 3D images within 3 months from the date of this Agreement and will update UCSC on timing if longer than 3 months is required.

#### IV.

KHM permits UC Santa Cruz to use and publish the images provided by KHM and the derived 3D models for the purpose of constructing an open-access, 3D online visualisation of Isabella d'Este's Studiolo on the website of the project IDEA. UC Santa Cruz has the right to (electronically) alter and amend the images to meet (e.g. quality, resolution and size) the technical requirements for implementation on the website of the IDEA project. Any further use, especially any other publication of the images or any reproduction of the 3D objects is subject to prior inquiry and consent of KHM.

The permission is subject to the following conditions:

- Any use of the data must include the name of the original object and its location in the Kunsthistorisches Museum Wien ("KHM-Museumsverband").
- UC Santa Cruz publishes the images in a maximum resolution in order not to allow reusing of the images (max. 200 000 vertices for 3D images, max. 2 000 x 2 000 pixel for 2D images).
- UC Santa Cruz is not entitled to use the images for commercial purposes.
- UC Santa Cruz has no right to transfer the images to any third party (including any other supporting institution) without written consent of KHM. Any transfer shall be subject to the same conditions as agreed upon in the present agreement and UC Santa Cruz will be liable for every breach of this agreement caused by the third party. KHM hereby consents to transfer of the images to the University of North Carolina, Chapel Hill, which participates in hosting the website of the project IDEA, for purposes of backup; and to CINECA, which will use the images to create the 3D models.
- UC Santa Cruz guarantees to take reasonable steps to protect the images from unauthorized use (e.g. download by any third party, reproduction) by the implementation of state of the art techniques and security measures. However, (a) UC Santa Cruz will not be responsible or liable for damages resulting from illegal circumvention of security measures and (b) UC Santa Cruz may permit download of lower resolution images (max. 200 000 vertices for 3D images, max. 2 000 x 2 000 pixel for 2D images) pursuant to applicable terms of use for the website meeting the standards of the CC BY-NC-SA 4.0 licence.

#### V.

In return, KHM will receive full access to the entire data of the 3D online visualisation of Isabella d'Este's Studiolo obtained by UC Santa Cruz. UC Santa Cruz grants KHM the right to display the visualisation in its own premises and to use the data for promoting the project on the KHM website and for KHM publications. KHM agrees to acknowledge UCSC and the Cineca VisitLab as co-creators of this data set in any displays or promotions where it is used.

The parties being cooperation partners, UC Santa Cruz will involve the KHM staff members concerned in the project, in particular by giving them the possibility to participate in project workshops with IDEA and CINECA. Furthermore, UC Santa Cruz will list KHM as a supporting institution on the project's website.

#### VI.

If UC Santa Cruz acts contrary to the regulations set up above, KHM reserves the right to cancel the present agreement subject to giving a written notice to UC Santa Cruz and after giving the written notice granting UC Santa Cruz a grace period of at least 10 working days to allow UC Santa Cruz to become in compliance with the regulations set up in this Agreement.

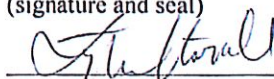
In that case, UC Santa Cruz has to delete all data provided by KHM and any backup made thereof from its server. UC Santa Cruz will not be required to delete the 3D models or 3D online visualizations derived from these images through efforts of UC Santa Cruz or its permitted collaborators.

#### VII.

Amendments of and additions to this Agreement shall be made in writing. All notifications and communications between the parties as provided for by this Agreement shall be made in writing.

Any dispute arising from this Agreement shall be subject to the exclusive jurisdiction of the competent court of the First District Vienna; Austrian law shall apply.

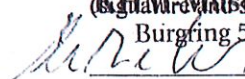
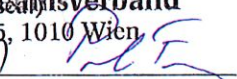
For the UC Santa Cruz  
(signature and seal)

  
(Dean Tyler Stovall)

For the KHM-Museumsverband

~~KHM-Museumsverband~~

Burggasse 5, 1010 Wien

   
GD Dr. Sabine Haag Dr. Paul Frey  
Executive Board

Date: 2/26/2018

Date: 01/03/2018







University Library  
1156 High Street  
Santa Cruz, CA 95064

PHONE: (831) 459-3187

January 10, 2018

Deanna Shemek  
Professor of Literature  
Co-Director, IDEA: Isabella d'Este Archive  
UC Santa Cruz  
1156 High St.  
Santa Cruz, CA 95064

Dear Dr. Shemek,

I am writing to provide institutional context for the IDEA project and articulate the support offered by the University Library to faculty-led digital projects through our Digital Scholarship Commons.

The University Library is committed to supporting digital scholarship projects like IDEA through its founding of a new Digital Scholarship Commons in McHenry Library. The space provides collaborative work areas and new workstations where Dr. Shemek and her team can build in 3D platforms and manipulate their digital data. The library also employs two full time Digital Humanities Librarians who are available to consult with Dr. Shemek on the IDEA project as it continues to develop.

Additionally, the University Library will provide consultation, best practices, and support for the long-term preservation of digital resources that make up or are created as part of the IDEA project. This service will facilitate the deposit of project files and metadata into the California Digital Library's Merritt repository. Staff will provide guidelines and standards to make sharing the data used by digital projects easier.

Shemek's work on IDEA has been one of several catalysts for institutional support for digital scholarship at UCSC, pushing both the Humanities Division and the Library to develop services that will secure institutional infrastructure to enable digital projects. We are excited by the progress made on the project in the past year and look forward to working directly with Dr. Shemek and her team as the IDEA project grows.

Sincerely,

A handwritten signature in cursive script, appearing to read "Elizabeth Cowell".

Elizabeth Cowell  
Richard L. Press University Librarian



Andrea Hesse, Director  
Academic Divisional Computing  
Information Technology Services  
University of California, Santa Cruz  
Santa Cruz, California 95065

January 10, 2018

Professor Deanna Schemek  
Literature Department  
Humanities Division  
University of California, Santa Cruz  
Santa Cruz, California 95064

Dear Deanna,

This letter is to confirm Humanities Computing Services support for your NEH Digital Advancement proposal for The Virtual Studiolo, and our commitment to host your dedicated server and provide nightly offsite backups as articulated in our service catalog. As a member of the Humanities Division faculty, this service is available to you indefinitely.

With best regards,

A handwritten signature in black ink, appearing to be "AH", written over a horizontal line.

Andrea Hesse, Director  
Academic Divisional Computing

cc. Jay Olson, Humanities Divisional Liaison, Information Technology Services



*Ministero dei Beni e delle  
Attività Culturali e del Turismo*

DIREZIONE GENERALE MUSEI  
COMPLESSO MUSEALE PALAZZO DUCALE DI MANTOVA

**MANTOVA** 16 GEN. 2018

prot. n. 177/31.07.01-1

To Prof. Deanna Shemek  
Department of Literature  
University of California, Santa Cruz  
Santa Cruz CA 95064

shemek@ucsc.edu

**SUBJECT:** Mantova, Complesso Museale Palazzo Ducale, Studiolo of Isabella d'Este, application for a Virtual Studiolo. Revised Support Letter and Photogrammetry

It is with great pleasure and excitement that I voice my support for the application of Professor Deanna Shemek for NEH funding to begin the creation of a Virtual Studiolo based on the famous studiolo of Isabella d'Este. I have been gratified and impressed by the progress to date on the IDEA: Isabella d'Este Archive, which now includes digitized versions of over 28,000 of Isabella d'Este's letters. These letters, filled with information about Renaissance life, are a precious resource for scholarly work on the period, as they document the life of one of the most extraordinary women in Italian history. Thanks to you, and to the former Director of the Mantuan State Archive, Daniela Ferrari (and your team of researchers and technicians), Isabella's correspondence is now online, searchable, and ready for study by anyone who wishes to access it. In addition, several other projects have come online in the last two years, including two wonderful films, on Isabella's music and her maiolica collections, and there are impressive research projects associated with these. I understand that a bibliography tool will also be added soon, and I know that you have very recently published your own collection of the selected letters of Isabella d'Este in English translation. In short, you are producing tools that are of great interest and cultural-historical value for scholars and the general public alike.

This next phase of IDEA, the Virtual Studiolo, is also extremely important and, from my perspective as Director of the Ducal Palace, even more significant than the online documents to which it will be linked. As you know well, the Ducal Palace has been designated a UNESCO World Heritage Site. Among its greatest claims to fame, along with the splendid fresco in the Camera degli Sposi by Andrea Mantegna, are the rooms Isabella designated as her studiolo and grotta, two diminutive spaces she filled with artistic treasures and expressions of her personality. These rooms were marvels; they were destinations for many of the most important intellectuals and princes of the sixteenth century, who wanted to see them; and they remain an obligatory object of study for students of Renaissance art. Despite their importance, today they are largely empty, since their contents were either sold or carried away by invaders after Isabella died. It has never been possible to reassemble, even for an exhibit, these rooms as Isabella inhabited them. The excitement generated by the Virtual Studiolo is clear, both from the online jury prize garnered by the short video you have produced to introduce the project—which indicates that people from around the world

Complesso Museale Palazzo Ducale di Mantova  
piazza Paccagnini 3 – 46100 MANTOVA – tel. 0376 352111 fax 0376 366274  
e-mail: [pal-mn@beniculturali.it](mailto:pal-mn@beniculturali.it) PEC [mbac-pal-mn@mailcert.beniculturali.it](mailto:mbac-pal-mn@mailcert.beniculturali.it)  
[www.mantovaducale.beniculturali.it](http://www.mantovaducale.beniculturali.it)

voted for this video—and from the appearance of a segment about the studiolo's photogrammetry on RAI's television program about science and technology, Superquark, this past summer.

The Ducal Palace receives more than 250.000 visitors every year, many of them American. Mantua, which boasts architectural gems by Leon Battista Alberti, Andrea Mantegna, and Giulio Romano among others, remains an important location on the circuit of Italy's "art cities." In 2016, it was designated an "Italian cultural capital" and saw an even greater surge of visitors.

To be able to open the studiolo virtually in a way that will allow the public to connect with it, not just in picture books or through exhibits of parts of Isabella's collection, will be an extraordinary achievement, one to which I will lend all possible assistance.

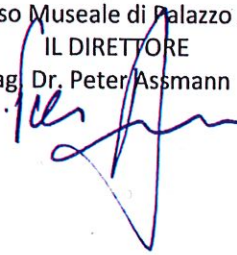
Following in-person meetings held you and your CINECA colleagues and my predecessor, Dr. Giovanna Paolozzi Strozzi, in 2014, and then a meeting with me in March of 2016, I provided access to the studiolo and grotta for purposes of photogrammetry of the space; this access enabled the creation of the 3D model of that will serve in the Virtual Studiolo project. I understand that you are now also working directly with the Kunsthistorisches Museum of Vienna on an agreement to produce photogrammetry of the objects from Isabella's collection that are held by that museum, and that you are moving into conversations with the Louvre to obtain very high-resolution images of Isabella's seven paintings, which the Louvre owns.

I support your endeavor with enthusiasm and hope you will succeed in obtaining funding for this collaboration between the United States and the Italian city of Mantua, so that visitors from around the world will have the pleasure and opportunity to study that the Virtual Studiolo promises to afford. I will, in addition, continue to do my best to give you access to these spaces for further photogrammetry and study.

Complesso Museale di Palazzo Ducale

IL DIRETTORE

Mag. Dr. Peter Assmann







FACTVM  
FOVNDATION  
DIGITAL TECHNOLOGY  
IN CONSERVATION

Madrid, January 15th of 2018

To whom it may concern,

The Factum Foundation for Digital Technology in Preservation is interested in collaborating with the Musée du Louvre and IDEA-Isabella d'Este Archive in the project 'Virtual Studiolo'.

The Factum Foundation has extensive experience in the development and application of non-contact digital technologies for the preservation, study and dissemination of art and cultural heritage. Pending confirmation of the museum's interest, it would therefore be our intention to participate in this project by producing 3D models, from high-resolution images, of seven paintings, held by the Musée du Louvre (Paris), which were once housed in the studiolo of Isabella d'Este, Marquess of Mantua.

The project of creating a 'Virtual Studiolo' is in line with the interests of the Factum Foundation. The application of cutting-edge recording technologies to the in-depth study and understanding of works of art and their original context is at the heart of our mission. We would be honoured to work with IDEA-Isabella d'Este Archive, the Musée du Louvre and other partners to make this project a reality.

We remain at your disposal to provide further information about our technologies and methodologies proposed for this project, as well as to facilitate examples of previous work.

Yours sincerely,

Adam Lowe

Founder  
Factum Foundation



FACTVM FOVNDATION

C/ Albarracín 28, 28037 Madrid  
Tel: (+34) 91 550 0978

CIF: G85614895  
factumfoundation.org

Alan B. Craig, PhD  
P.O. Box 5020  
Champaign, IL 61825

January 11, 2018

To Whom It May Concern,

It is my pleasure to write this letter in support of Professor Deanna Shemek's Virtual Studiolo proposal. I have had numerous discussions with Professor Shemek and her team regarding her "Isabella d'Este Archive (IDEA) Virtual Studiolo" project, and particularly regarding the ideas of using the media of virtual and augmented reality in conjunction with the project.

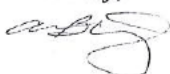
Having written three books on the media of augmented and virtual reality (*Understanding Augmented Reality*, *Understanding Virtual Reality*, *Developing Virtual Reality Applications* all from Morgan Kaufmann Publishing), I have given considerable thought to the use of these media in research and teaching, and have had the opportunity to see and experience numerous projects and proposed projects. Both AR and VR are particularly well suited for use in projects in which the subject material relies on an understanding of spatial relationships, scale, and relationship with the participant's sense of proprioception. These issues are particularly important in the IDEA project, and as such, both VR and AR provide affordances that are likely to greatly enhance understanding of the Studiolo. The team has also considered how VR and AR can make the ideas of the Studiolo more accessible to a wide variety of participants both at the actual site, but also for those who cannot experience the actual Studiolo location.

In my role as Humanities Specialist for NSF's Extreme Science and Engineering Discovery Environment (XSEDE) I have learned that one of the key challenges to digital projects in the humanities is the lack of technical expertise on the humanities team. I have had the opportunity to dialog with the technical team that Professor Shemek has engaged for this project via CINECA, and I have seen the results of some of their previous projects. I feel confident in their ability to carry out the technical development required for this project.

In summary, I believe this to be a very worthwhile and exciting project, and one that augmented reality and virtual reality contribute to in a substantive way, as opposed to many projects that integrate VR and / or AR purely for the "gee whiz" or novelty aspects of those media. In my opinion, the project is well thought through and the team has the necessary skills to carry out what they propose.

Please feel free to contact me at (b) (6) or (b) (6) if you need any clarifications of my endorsement of this project or if I can be of any further service.

Sincerely,



Alan B. Craig, PhD

## 8. Virtual Studiolo Data Management Plan

### 1. Roles and responsibilities

This data management plan will be implemented and managed by PI Deanna Shemek, Co-PI MacNeil, and developers at Cineca led by Maria Chiara Liguori and Antonella Guidazzoli. Cineca will create the data from images received from the Ducal Palace of Mantua and the Kunsthistorisches Museum, Vienna and transfer it to a dedicated server at the University of California, Santa Cruz when the project is complete. Cineca staff will be responsible for the hosting, preservation, and protection of the data as PI develops the project and seeks funds for its successive phases. A backup copy will also be held at the University of North Carolina, Chapel Hill. The finished site and its metadata will be made freely accessible to the public. Museum images may be covered by third-party restrictions. In the event of a departure from UC Santa Cruz by PI Deanna Shemek, these responsibilities may be renegotiated with a new institution.

### 2. Expected data

Data we have already produced covers the construction of the *studiolo* virtual space and several tools necessary to curate that space by populating it with 3D models. We now have a 3D model of the *studiolo* in high/low polygon resolution (Software: Gimp, MeshLab, Blender). We have thus far produced one 3D model (of a medal) and an ad hoc repository for archiving 3D models of objects currently held in a number of museums (Software: SVN, Drupal, Django). We also have a selection of a set of metadata for 3D models, following European Union project guidelines <http://3dicons-project.eu/eng> We aim with this grant to produce:

- A Photogrammetric and laser scanner survey of additional *studiolo* space (Hardware: Superphaser laser scanner; Nikon D800 Photocamera).
- A low polygon desktop visualization of the *studiolo* realized with WebGL via X3D or other current technologies to be determined.
- High polygon resolution renderings of the *studiolo* space for use in animation, 3D stereo, immersive environments in later phases of the IDEA Virtual Studiolo project. (Software: Blender with Blender Render Farm operating on CINECA Supercomputer PLX <http://www.hpc.cineca.it/hardware/ibm-plx>)
- Interactive user requirements and design
- Study and working plan for harvesting and linking data from the IDEA documents platform and music interface with the Virtual Studiolo.

Deliverables: 3D models of three items from the KHM collection, measuring tool, lighting studies, time slider, hide/show functions for items in the Virtual Studiolo, 3D VR visualizations for headsets (no interaction), interactive map of historic *studiolo* content acquisitions and locations.

### 3. Period of data retention

To host the project data, CINECA will use its in-house storage facility, Hpc-Forge (Forge). Forge is constructed with OpenSource components (Apache, Drupal, Django, Python, SVN, WebDav, Elfinder) and customized code. Hardware components – <http://www.cineca.it/en/content/front-end-cluster> UCSC, UNC, and Cineca agree to retain the data indefinitely. If the project should be retired for any reason, it will continue to reside in the University of California Digital Library Repository and the Carolina Digital Library.