Digital Humanities, Egyptology & Heritage Preservation
A Comparative Perspective

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Abstracts

Adam Anderson (UC Berkeley)
The Case for 3D Cuneiform
Thanks to recent high-profile scandals in the news, most of us are already familiar with the present state of affairs involving the collections of artifacts with writing from the ancient Near East. By applying modern 3D scanning to a collection of cuneiform tablets in the Hearst collection, we can use what we have already to address the endless cycle of the destruction of our cultural heritage, and give concrete examples of how new computational methods can be used to restore the missing context of ancient archives as they continue to be pulled from the ground through illicit looting and illegal excavations.

Ralph Birk (LMU)
The Ptolemaic synodal decrees: new texts in an old idiom
The Rosetta stone constitutes the centerpiece for the decipherment of the hieroglyphic script, but is only one of many priestly decrees from the Ptolemaic period that span from 243 to 111 BCE. In these decrees, the priestly synods decide on honors for the king and queen and on economic, administrative and cultic regulations for the temple and also address relevant historic events. It has now been widely acknowledged that the trilingual decrees (greek, demotic and late middle Egyptian) have the greek version as their origin, but the relationship between demotic and the hieroglyphic / late middle Egyptian texts in the production of the decrees is still a matter of debate. At the center of this heated discussion lie the priests' abilities of hellenistic times to write new texts in a dead idiom, late middle Egyptian. Were they actively engaging with tradition or just passively preserving it by patching well known phrases? A new project based at the FU Berlin and the Berlin-Brandenburg Academy of Sciences questions the textual coherence of the Egyptian versions, in order to better assess these linguistic abilities of Egyptian priests at the end of the 1st millenium BCE through quantitative methods.

Arianna Campiani and Nicola Lercari (UC Merced)
The *Digital Maya Heritage Project*: digital documentation at Palenque, Chiapas
Over the last two decades, climate change, growing political instability, and looting have led to the deterioration of numerous Mesoamerican archaeological sites. In this scenario, digital

documentation and remote sensing technologies become invaluable resources to record, monitor, and preserve the diverse Maya cultural heritage of the Southern Mexican state of Chiapas. In this presentation we will discuss the preliminary results of our intra-site digital documentation work at the World Heritage site of Palenque, Mexico. We will also discuss the potential of integrating intra-site and inter-site digital documentation technologies, such as Unmanned Aerial Systems, image-based modeling, terrestrial laser scanning, and drone-based airborne LiDAR with ground truthing and physical conservation interventions to foster built heritage interpretation, conservation, and preservation in Mexico and in other countries with a high concentration of heritage sites but limited research funding.

Melissa Cradic (UC Berkeley)
Documenting the Dead in the Bronze Age Levant
Recent seasons of excavation at Tel Megiddo (Israel) have brought to light several aspects of Bronze Age mortuary practices that have been instrumental in contextualizing finds from previous expeditions at the site. Work from the 2016 excavation season uncovered Tomb 50, a constructed chamber tomb from the end of the Middle Bronze Age (ca. 17th century B.C.E). The tomb contained at least nine individuals who were buried alongside a rich assemblage of ceramic vessels, precious metals, and decorated bone objects. The excavation of Tomb 50 was documented in unparalleled spatial resolution using 3D photogrammetry, and the finds are under comprehensive study by an interdisciplinary team of collaborators. The talk presents a preliminary summary of this exceptional burial context and the new excavation and research methods used to document and analyze the finds. The high-resolution data from in and around this tomb provide an excellent case study to answer questions about the relationships between the deceased individuals in life and after death. This presentation will focus special attention on how these new documentation methods contribute to reconstructing burial taphonomy and the extended sequence of funerary rituals carried out at this burial site in antiquity.

Melanie Flossmann-Schütze (LMU)
Preservation and Digital Humanities in times of change. A case study from Middle Egypt
Heritage Preservation is a major concern of both Egypt's authorities and archaeologists from abroad working in Egypt. Beside classical excavations, archaeological projects are usually engaged with archaeometry, conservation/restauration techniques as well as site management. Sustainable preservation of cultural heritage is only possible with the involvement of local communities. Digital humanities theoretically enlarge the possibilities for heritage preservation in Egypt. But due to the current political situation, heritage preservation suffers a setback at several sites and restrictions encumber the use of digital techniques during fieldwork. The joint mission Cairo-Munich is working in Tuna el-Gebel (Middle Egypt) since 1989. The lecture aims to present some case studies related to this topic.

Patrizia Heindl (LMU)
A Database for Late Period Statues
In occasion of the LMU- Berkeley workshop hold in Munich in July 2018, I presented the idea for a database for statues of the Late Period. Now that idea is taking shape, through the development of an easily accessible and clear database. Both iconographic details and the placement of titles, names and inscriptions should be searchable. To understand the function and design of the so-called private statues, it is necessary to have a look at all the statues as

multimodal communication objects. Because a comprehensive processing of the objects is very time- consuming and intensive, it is necessary to work together as a team. I would like to highlight the benefits for researchers and research that can result from working together on such a project.

Christina Hodge (Stanford University)
***Our Dark Materials*: Applying Digital Humanities to an Exhibit of Egyptian Archaeology**
How might we do more with the accumulated "back end" of resources powering the visible "front end" of a museum exhibit? The talk will introduce the current Stanford University Archaeology Collections (SUAC) exhibit *Our Dark Materials: Rediscovering an Egyptian Collection* (ODM) and, through it, consider the potential of digital humanities to extend and enhance the impact of in-real-life museum displays. By affording personal encounters with authentic artifacts, traditional exhibits offer an experience that cannot be digitally duplicated. But exhibits are simultaneously constrained by their materiality. The physical manifestation of ODM presents only a small portion of the information assembled and knowledge produced during its creation. This talk will introduce SUAC's Egyptian exhibit, summarize curatorial discoveries, and report on a Design Thinking exercise to imagine potential digital humanities projects using ODM's research archive.

Jessica Johnston (UC Berkeley) and Chris Hoffman (UC Berkeley)
Immersive environments for the study and dissemination of 3D models: VR & the Cave Kiosk at UC Berkeley
In this practical session, we demonstrate the results of several projects involving the use of visualization technologies to immerse the viewer in material and spatial content from Ancient Egypt and other cultural heritage contexts. The centerpiece of these projects is the HearstCAVE, a 3D visualization wall in the gallery of the Hearst Museum of Anthropology. Session participants will have an opportunity to see the 26th Dynasty sarcophagus of Psametik in a variety of visualization media, including an early version of a virtual reality application.

Kea Johnston (UC Berkeley)
How to build 3D models for ancient coffins: software and methodologies
Photogrammetry is a technique used to create 3D models by comparing the same location across multiple photographs, using the geometry of the camera lens to calculate its position in space. The key to creating a good model lies in taking good, sharp photographs of the object from a variety of angles. Outside of the studio (and in the museum basement), conditions are hardly ever ideal. This talk will discuss the challenges posed by a particular coffin that was photographed for the Book of the Dead in 3D project—the box-coffin of a boy named Patjenef. Here, I discuss how we approached building the model of the coffin, how we solved the problems posed by building a model of a highly fragile object decorated on all sides, and things that we learned for future models.

Jessica Kaiser (UC Berkeley)
A Changing Narrative: Preliminary Findings from the Abydos Temple Paper Archive
Few scholars would deny that Egyptology and colonialism essentially grew up together. For much of its early history, the discipline was completely dominated by Western interests. During this time, native scholars were generally being excluded from academic careers, and thus in effect denied the opportunity to participate in the narrative of their own heritage. Even when the majority of the workforce on western-led excavations were Egyptian, their names are rarely, if at all,

mentioned in the resulting publications. In 2013, however, a previously unexamined archive was discovered in a storage room in Abydos. This collection of papers challenges the view of Egyptian heritage workers as victims of the colonial discourse of Egyptology and bystanders in the production of historical knowledge. It consists of thousands of documents from the Inspectorate of Sohag and beyond, related to the development of cultural heritage management in the Egyptian Ministry of Antiquities from the mid-nineteenth century through the 1960's, and ascribes a much greater agency to native Egyptians than previously assumed. The archive is currently in the process of being digitized by an international team, sponsored by UC Berkeley in collaboration with the Egyptian Ministry of Antiquities and Humboldt University Berlin. This paper will present an overview of the preliminary findings of the first two seasons of the Abydos Temple Paper Archive Project, and provide a few examples of the fascinating stories it has uncovered.The Abydos Archive Project

Nicola Lercari (UC Merced)
Archaeological Citizen Science at Bodie State Historic Park
Bodie State Historic Park is located in the western Great Basin, near the California and Nevada border and encompasses a 2,900-acre historical landscape comprised of buildings, archaeological sites, and features related to 80 years of Gold Rush era mining and millennia of native people occupation. Cultural and natural resources at Bodie are at risk of being lost due to wildfires, earthquakes, and lack of funding. At Bodie, UC Merced scholars and California State Parks cultural resources specialists collaborate on research data dissemination and outreach leveraging mobile apps, Augmented Reality techniques, and digital documentation technologies. Discussing the implementation of a pilot archaeological citizen science program at Bodie, this presentation discusses the role of community-based participatory methods to increase participation in the collection of archaeological data and engage the public in creating a database of in situ artifacts. We hope that active involvement will lead to the public's appreciation of the park's valuable resources and foster a true sense of stewardship and preservation.

Brooke Norton (UC Berkeley)
Robots and Looters Holes: Exploration at el-Hibeh in the Aftermath of the Egyptian Revolution
In the aftermath of the 2011 Egyptian Revolution the first millennium BCE Egyptian settlement el-Hibeh, located in Middle Egypt, was badly damaged by looters. During the summer of 2017, the UC Berkeley El Hibeh Project team returned to the site after five years to investigate the extent of damage to the site and document the looting practices in the intervening years and to develop a plan for how to deal with the damage. This talk will examine the cross-disciplinary collaboration between UC Berkeley Egyptologists and robotic engineers from Ryerson University in Toronto to implement robots in the field to assess the damage done by looters and to discover potential areas of the site to explore in future seasons. This talk will further address how the use of robots as a tool for archaeologists can aid in the documentation and exploration of archaeological sites.

Alexander Schutze (LMU)
"A distant reading" and the study of 26th dynasty officials' monuments
High officials of the 26th Dynasty (664-526 BCE) are a social formation well documented through hundreds of inscribed monuments like sarcophagi, statues, shabtis, stelae, seal impressions, etc. Among these monuments, the more than five hundred so-called private statues are particularly

interesting as they are complex three-dimensional objects combining iconographic and stylistic features with religious and biographic texts.
Surprisingly, only a limited number of these statues is discussed in scholarly literature; monuments of better known officials like Monthemhet, Perftuauneith or Udjahorresnet (early 27th Dynasty) are overrepresented in the studies of the Late Period statuary. There are several reasons for this selective perception of Late Period statuary and the situation seems to be structurally analogous to the literary studies. Scholars of literature are usually confining themselves to a canon of 19th Century Western literature although millions of other literary works of the very same period are known. Franco Moretti criticizes this scholarly practice and proposes a "distant reading" of the whole literary production of the 19th Century, in contrast to a "close reading" of a limited set of canonical literary works, in order to gain a more nuanced picture of the whole cultural production. Inspired by Moretti's theory, I would like to present a data science informed approach to the study of the statuary of the 26th Dynasty officials

Casondra Sobieralski (UC Santa Cruz)

Mapping Hathor through Canaan

I am interested in spatial storytelling through creating immersive environments that bring history alive. I am also interested in how sensory archaeology can inform such storytelling. My current research towards these goals focuses on conceptually mapping the Egyptian goddess Hathor through Canaan. Hathor, my avatar on this research journey, was a popular life affirming, joy-and-pleasure goddess of the Ancient Near East. (when appeased). I am portraying her as a "proto-cybergoddess" because of her relationship to sound, vibration, and copper, which have all played significant roles in the history of media technologies. I am seeking to create a feminist methodology of socially aware, fluid, interactive, ground-based story mapping via sound, space and the body as an alternative to the convention of 2D, static, aerial mapping which is limited to a remote visuality and stakes its ideological roots in militarism and colonialism.

The first leg of my field research exploration began in July of 2017. I concentrated on recording sounds of a sistrum—an instrument sacred to Hathor and used by her musicians and priestesses—throughout Timna Park, Israel. Timna is a site in the Negev where ancient Egyptians mined copper under five pharaohs starting with Seti I (about 3500 years ago). The miners at Timna celebrated the goddess Hathor as the "Goddess of the Mountain" and a goddess of copper, malachite and turquoise. They seem to have "recycled" a local temple for her veneration. I will be discussing my preliminary sound, video, and 360-video sketches from Timna and revealing where I want to take my research over the next three years to further develop "Mapping Hathor Through Canaan."

Elaine Sullivan (UC Santa Cruz)

Context at the necropolis: Using 3D reconstruction modeling to visualize funerary culture at multiple scales

In the study of funerary objects, scholars consider the wider archaeological context of any artefact, layering information about the associated tomb and cemetery landscape to interpret an object's meaning and significance. Improving technologies in photogrammetry, Geographic Information Systems, and 3D reconstruction modeling are now making possible the combination of 3D visualizations at these same scales, allowing for the virtual integration of each level of information: object>tomb>landscape. This paper will discuss how a collaboration between scholars from UC Santa Cruz and UC Berkeley are experimenting with creating Virtual Reality experiences that re-

place a Late Period sarcophagus within its original tomb and contemporary landscape at Saqqara. The project attempts to emphasize the importance of context in understanding Egyptian funerary objects, especially for the general public, who generally encounter funerary objects in the museum setting.

Justin Underhill (UC Berkeley)
Horizons of interactivity in 3D modeling and cultural heritage
This talk will review how I use laser scanning and photogrammetry as tools for digital art history, and how these workflows can be adapted to VR development and museum education. Several case studies from the ancient and early modern world will be reviewed.

David Wheeler (UC Berkeley) and David Cook
From the Field to the Classroom: 3D Scans and Models as Teaching Tools
In this paper, we explore how 3D models of pottery created in the 2018 season of UC Berkeley's excavations at Aidonia (Greece) using photogrammetry and laser scanning can be used as teaching tools in the classroom. In particular, we will go through the process of how we printed 3D models of these objects and show how, when presented alongside sherds in the Nemea Center for Classical Archaeology's teaching collection, these models become effective tools to help students engage with and better understand artifacts in a classroom setting. We will then close with a brief summery of the next phase of our research, which will explore how 3D scans of Egyptian artifacts housed in the Hearst Museum collection can be harnessed in a similar way both in the classroom and also in the museum gallery.

Paola Zanovello, Giulia Deotto
Tebtynis: a private view. Rediscovering the Site Through Archives and the Use of New Technologies
A multidisciplinary team, led by prof. Paola Zanovello (University of Padua, Italy), in cooperation with Ian Begg (Trent University, Canada), is working on two archives preserved in Italy and in Canada, collected by the archaeologists Carlo Anti (Villafranca di Verona, 1889 – Padua, 1961) and Gilbert Bagnani (Rome, 1900 – Ontario - Canada, 1985).
The aim of this research is to reconstruct the seven missions realized by Anti and Bagnani in the Egyptian site of Tebtynis in the Thirties and to analyse their discoveries, through the analysis of their huge documentation, the use of new technologies and new methods of investigation. In this framework, we will present the preliminary results related to the 3D reconstruction of the vestibule of the sanctuary of Soknebtynis and the 3D model of two statues discovered during the historical dig at the site.
Padua Team: Giulia Deotto, Alessandra Menegazzi, Carlo Urbani, Armando De Guio, Luigi Magnini, Andrea Meleri, Ivana Angelini, Cinzia Bettineschi, Giuseppe Salemi, Emanuela Faresin, Elisa Brener, Paola Zanovello with Ian Begg (Trent University, Canada)