Bookdown test

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Contents

Chapter 1

Bookdown test

It's a practice version. . . not even a draft here yet!

1.1 Here's a subheading

Here's a link using angle brackets: http://www.google.com

Here's an HTML iframe: will it render?

Contributors

Jack Dougherty

Jack Dougherty has no idea how Bookdown works, but he will crib as much as possible from GitHub open repositories by Shawn Graham and Lincoln Mullen. . .

Welcome!

Digital archaeology as a field rests upon the creative use of primarily open-source and/or open-access materials to archive, reuse, visualize, analyze and communicate archaeological data. This reliance on open-source and open-access is a political stance that emerges in opposition to archaeology's past complicity in colonial enterprises and scholarship; digital archaeology resists the digital neo-colonialism of Google, Facebook, and similar tech giants that typically promote disciplinary silos and closed data repositories. Specifically, digital archaeology encourages innovative, reflective, and critical use of open access data and the development of digital tools that facilitate linkages and analysis across varied digital sources.

To that end, this document you are reading is integrated with a cloud-based digital exploratory laboratory of multiple cloud-computing tools with teaching materials that instructors will be able to use 'out-of-the-box' with a single click, or to remix as circumstances dictate. Part of our inspiration comes from the 'DHBox' project from CUNY (City University of New York, (link), a project that is creating a 'digital humanities laboratory' in the cloud. While the tools of the digital humanities are congruent with those of digital archaeology, they are typically configured to work with texts rather than material culture in which archaeologists specialise. The second inspiration is the open-access guide 'The Programming Historian', which is a series of how-tos and tutorials (link) pitched at historians confronting digital sources for the first time. A key challenge scholars face in carrying out novel digital analysis is how to install or configure software; each 'Programming Historian' tutorial therefore explains in length and in detail how to configure software. The present e-textbook merges the best of both approaches to create a singular experience for instructors and students: a one-click digital laboratory approach, where installation of materials is not an issue, and with carefully designed tutorials and lessons on theory and practice in digital archaeology.

This is not a textbook about learning how to code. Rather, it is about instilling the habits of thought that will enable success when confronted with digital novelty, the habits of thought that will enable you to determine how to work with digital materials, and the habits of thought that permit you to see where and when digital approaches will make the difference in your research. Skills change; techniques evolve; new tools emerge. Habits of thought are hard to cultivate but have staying power!

Through this textbook, we (Graham, Gupta, Carter and Compton) aim to offer a learners'-perspective-view on digital methods in archaeology, that is, how we might think with, and through, digital sources of information, digital tools and technologies and their relationship with society. We are deeply aware of how rapidly both digital sources and technologies can change, particularly on the Web; we therefore present this e-textbook and open-learning environment as a guide to best practices when working with available digital data and digital tools, what kinds of analysis are possible, how to perform these analytical techniques, and how you might publish your data, making them re-usable for another scholar and ethics and ethical issues in doing digital archaeology.

Chapter 2

Going Digital

> Digital archaeology should exist to assist us in the performance of archaeology as a whole. It should not be a secret knowledge, nor a distinct school of thought, but rather simply seen as archaeology done well, using all of the tools available to and in better recovering, understanding and presenting the past. In the end, there is no such thing as digital archaeology. What exists, or at least what should exist, are intelligent and practical ways of applying the use of computers to archaeology that better enable us to pursue both our theoretical questions and our methodological applications. (Evans, Daly, and MyiLibrary 2006)

While we agree with the first part of the sentiment, the second part is rather up for debate. We believe that there *is* such a thing as digital archaeology. Digital tools exist in a meshwork of legal and cultural obligations, and moreso than any other tool humans have yet come up with, have the capability to exert their own agency upon the user. Digital tools and their use are not theory-free nor without theoretical implications. There is no such thing as neutral, when digital tools are employed. This is why digital archaeology is - or should be - a distinct subfield of the wider archaeological project.

In a conversation initiated on Twitter on March 10, 2017, Graham asked the question (the thread for which discussion starts here), 'is digital archaeology the same as using computers in archaeology?' The resulting conversation ranged widely over everything from the topic of study to the ways in which computational power enables the researcher to ask questions that were not previously feasible to ask. Other researchers sounded a note of caution against the kind of 'technological fetishism' that digital work can often fall pray to, especially given the larger issues of gender and 'solutionitis' that emerge given the white, 20-35 year old demographic of many tech workers (for criticisms of technological solutionism or utopianism in archaeology, see the work of Colleen Morgan (2012) Joyce, Tringham, Morozov, Kansa). Others sounded a warning that to think of digital archaeology as something distinct from archaeology risks 'going the way of DH' and instead appealed for a holistic understanding.

Hanna Marie Pageau succintly captured these issues, when over a series of tweets beginning here she wrote,

> 'Digital archaeology has an obvious digital component. However, saying it's simply using a computer is like saying being a computer scientist means you use a computer to do science. There is an implied addition [to the] topic of specific methods that brings you from an archaeologist using a computer to being an archaeologist who studies digital archaeology. I would argue that archaeogaming is the most straight forward example. Because while gaming is usually thought of as digital, it could study table top gaming and not technically be digital in nature. However if you're studying ethics of representation in games you're going from just using a computer as a tool to it being THE medium.'

In which case, an important aspect of digital archaeology that differentiates it from the use of computing power to answer archaeological questions is this question of purpose. In this section, we take up this question beginning with the question of *teaching* digital approaches. We progress by suggesting that digital archaeology

is akin to work at the intersection of art and public archaeology and digital humanities. We provide you the necessary basics for setting up your own digital archaeological practice. Entrance into the world of digital archaeology requires organizational ability and facility with versioning files. It is allied with the practice of open notebook science, and it attempts to future-proof by using the simplest file formats and avoiding proprietary software where possible. These are the basics on which the rest of digital archaeological practice is founded.

2.1 So what is Digital Archaeology?

If you are holding this book in your hands, via a device or on paper, or looking at it on your desktop, you might wonder why we feel it necessary to even ask the question. It is important at the outset to make the argument that digital archaeology is not about 'mere' tool use. Andrew Goldstone in *Debates in the Digital Humanities* discusses this tension (Goldstone 2018). He has found (and Lincoln Mullen concurs with regard to his own teaching,(Mullen 2017)) that our current optimism about teaching technical facility is misplaced. Tools first, context second doesn't work. Alternatively, theory first doesn't seem to work either. And finally, for anything to work at all, datasets have to be curated and carefully pruned for their pedagogical value. We can't simply turn students loose on a dataset (or worse, ask them to build their own) and expect 'learning' to happen.

Our approach in this volume is to resolve that seeming paradox by providing not just the tools, and not just the data, but also the computer itself. Archaeologically, this puts our volume in dialog with the work of scholars such as Ben Marwick, who makes available with his research the code, the dependencies, and sometimes, an entire virtual machine, to enable other scholars to replicate, reuse, or dispute his conclusions. We want you to reuse our code, to study it, and to improve upon it. We want you to annotate our pages, and point out our errors. For us, digital archaeology is not the mere use of computational tools to answer archaeological questions. Rather, it is to enable the audience for archaeological thinking to enter into conversation with us, and to *do* archaeology for themselves.

Digital archaeology is necessarily a public archaeology. This is its principal difference with what has come before, for never forget, there has been at least a half-century of innovative use of computational power for archaeological knowledge building.

Geospatial, digital and Web-based tools are now central to carrying out archaeological research and to communicating archaeological information in a globalized world. Until recently, the accumulation and effective management of digital archaeological data have been the primary focus of archaeologists (Evans and Daly 2006). Under this model, scholars emphasize the 'integration' into archaeology of computing technologies, and how, by utilizing current available computing memory and processer speed, one does archaeology, only better (Daly and Evans 2006: 1). This situation in turn demonstrates the 'marriage between the two', archaeology and computing (Daly and Evans 2006: 2).

For Evans and Daly (2006), writing in the first decade of the 21st century, digital archaeology was synonymous with the use of Information and Communication Technology or ICT, and reflected wider efforts at that moment to transform education through newly available digital tools. Some scholars and policy makers believed that digital technologies were the answer to pressing global social issues such as poverty, a point that we will discuss later.

More recently, in his inaugural editorial for the open-access journal, Frontiers in Digital Humanities, Costopoulos (2016) argues that 'digital archaeology has been [here] a while'. Computing in archaeology, that is 'doing archaeology digitally' as (Costopolous 2016) remarks, constitutes a 'state of normality' in archaeological practice. This view places emphasis on the availability of digital tools and their use in institutional contexts, overlooking the highly structured nature of social groups that employ these tools, and where, how and why these technologies are created and used. While fruitful, these views tend to obscure broader developments in the social sciences and humanities, of which archaeology is a part, and underestimate the changing relationship between archaeology and society.

2.1.1 A distant view

Ethan Watrall has drawn the history of computational archaeology/digital archaeology all the way back to the pioneering work of James Deetz in the 1960s, who used computers at MIT to perform stylistic analyses of Arikara ceramics (Ethan Watrall n.d., @deetz_dynamics_1965). Most early interest in computation for archaeology was centred on the potential for computational databases, although ambition often out-stripped capability. By the 1970s, serious efforts were being put into work to build the infrastructural knowledge necessary to make and usefully query archaeological datasets. One can see this concern play out by considering a `topic model` (Shawn Graham 2014) of the early volumes of the Computer Applications in Archaeology (a topic model is a way of deducing latent patterns of discourse within text, based on patternings of words (See Graham, Weingart, and Milligan 2012)):

topic 1 – computer, program, may, storage, then, excavation, recording, all, into, form, using, retrieval, any, user, output, records, package, entry, one, unit

topic 6: but, they, one, time, their, all, some, only, will, there, would, what, very, our, other, any, most, them, even

topic 20: some, will, many, there, field, problems, may, but, archaeologists, excavation, their, they, recording, however, record, new, systems, most, should, need

2.2 Project Management Basics

A digital project, whether in archaeology or in other fields, iterates through the same basic steps. There is

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1. finding data
2. fixing data
3. analyzing the data
4. communicating the story in the data
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Eighty percent of your time on any digital project will be invested in cleaning up the data and documenting what you've done to it. But in truth, a digital project begins long before we ever look at a data set (or are given data to work with, if we're part of a larger project). How do we formulate a research question or our exploration more generally? How do we translate a gut feeling or intution or curiosity into something that is *operable*? REF Moretti on operationalizing things

The four steps we identified above are cyclical; at any one time you might be at a different stage of the process. Indeed, those four steps could easily be subsumed under what Simon Appleford and Jennifer Guiliano of devdh.org identify as the 'Best Practice Principles Of Designing Your First Project.' For Appleford and Guiliano, the outline of a project involves figuring out:

1. the question, problem, or provocation
2. sources (primary, secondary)
3. analytical activity
4. audience
5. product

Note that 4, audience, comes before 5, product. You must think of your reader/user!

Let us imagine that we were inspired by Allison Mickel's piece, 'Tracing Teams, Texts, and Topics: Applying Social Network Analysis to Understand Archaeological Knowledge Production at Çatalhöyük' (Mickel 2016).

We could frame a question: 'What role do social networks play in the development of knowledge production at my site?'

We could frame a problem: 'Mickel's exploration of social networks considered x, but not y.'

We could frame a provocation: 'Social Network Analysis promises to revolutionize our knowledge of the social contexts that underpin archaeological fieldwork, putting this power in the hands of everyone from the site director on down.'

Chapter 3

Making Data Durable

Elsewhere in this text we've covered approaches to creating digital archaeology data. Section 1.1 discusses three great habits to maintain while working digitally ref back to "The first steps in going digital are quite easy. They are fundamentally a question of maintaining some basic good habits. Everything else flows from these three habits:" section 1.1.6. These principles will help you and future researchers use your data, reproduce your conclusions and "future-proof" your digital work.

Prepare yourself for a little journey. In a dreamlike state, you find yourself in a time machine, noticing that you have traveled to a point in the far or not-so-distant future. You arrive in your own lab to find a group of researchers puzzling over the information you created in the time before, trying to reconstruct your conclusions and make some kind of sense of it all.

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"What are these strange codes?"
"Does this thing go with that? It looks like there's a bit missing, but we can't be sure."
"What was on all those corrupted flash drives? Does anyone even have a flash-drive-to-skull-jack conver
"WHAT WAS THIS PERSON THINKING?"
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It doesn't have to be this way. Most archaeological researchers have encountered "bad" data in the past when trying to understand or reconstruct someone's conclusions from field notes and excavation reports. What makes a dataset bad?

3.1 Designing Data Collection

In teaching, there is a concept called 'backwards design', where you design your lesson from the end point you wish your students to achieve. The same is true of data. Knowing that archaeology is destructive, and that the processes of archaeology *creates* new kinds of artefacts (drawings, photos, record sheets, labels, and so on), we need to start at the end. Ideally, it is an end point that will allow someone else to reconsider the archaeological record that you have created. As Gavin Lucas (Lucas 2012), the idea of an 'archaeological record' is a three-fold, trinity-like concept-

- the material culture broadly understood
- the 'formation theory' of how that material culture came to be
- and the materialization of the construction of that material culture in the present: our archive

And so, we will begin this section on data collection by thinking through where the *things* are going to go.

Where to put your data

LOCKSS Choosing a repository Does it have room for your stuff? Is your stuff within the purview of its digital archivists? How long is this place going to be around? Does it have plans for migrating and maintaining your files? Choosing what you want to curate Simple formats = easier migration Convert databases to xml or csv

tables with relationships Lossless files. TIFF over JPEG CAD- no archival alternative Geospatial- GeoJSON is text-based and human readable 3D- a new frontier in digital preservation (we don't know how to do it)

3.1.1 discussion

3.1.2 exercises

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