Geography 80 – Fall 2019
Digital Worlds: Introduction to Geospatial Technologies

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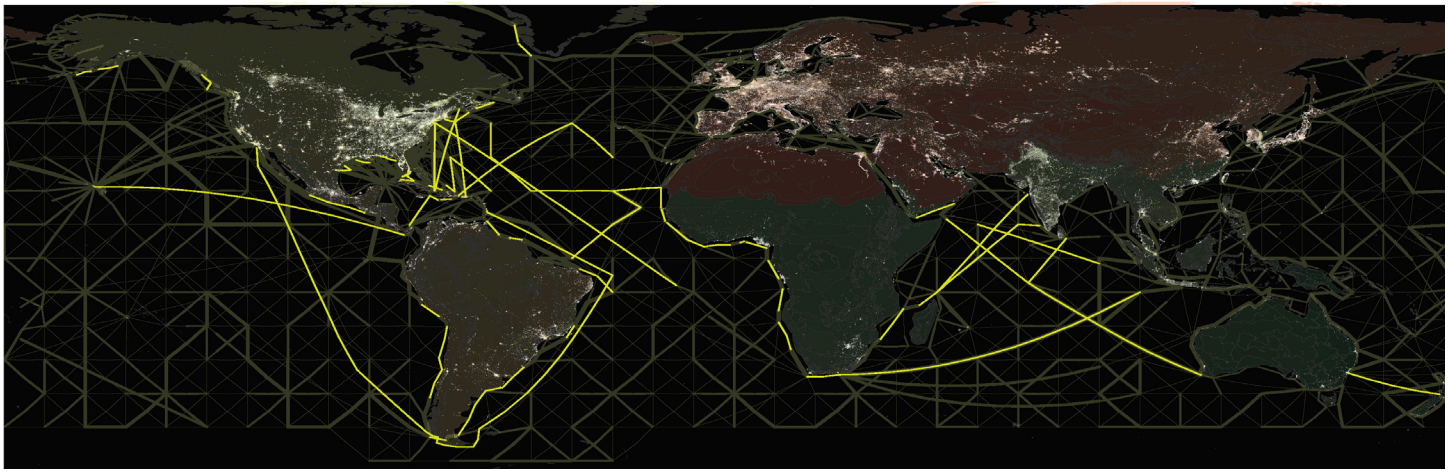
Readers: Caralyn Gorman and Ofurhe Igbinedion

Schedule: Lectures: Mon and Wed, 9-10am, (McCone 145)
Labs: Tue, 11am-1pm, Wed, 1-3pm, Fri, 1-3pm (CAGE Lab, McCone 535)

Office hours: Will: Wed, 10am-12pm, McCone 197 (https://calendly.com/willbpayne)
Xiaowei: Thu, 12-2pm, McCone 583 (https://calendly.com/xiaoweirwang)



From ensuring you receive the weather report for the correct location and giving you up-to-date traffic maps to making sure your local supermarket receives shipment on time, a global network of smartphones, server farms, and satellites has accelerated the integration of geospatial information technologies into everyday life.

While this can be empowering, those same data are frequently mined without knowledge or consent by multi-national corporations and government surveillance programs alike with little regulation and privacy considerations. Technologies that tout novelty and neutrality often reinforce established inequity and privilege. In each case, the power of these digital worlds is underpinned by massive amounts of geospatial data. The key to deciphering how they work–and for whom–is thinking and seeing geographically. This course will introduce you to foundational geospatial technologies alongside critical concepts from geography and related fields, in three ways:

1. We will learn about the **key concepts behind geospatial tools and technologies** to better understand how things work beyond the point-click-type operations of the tools themselves. We will look at topics such as map projections, spatial data types, simple types of spatial analysis, map design, and so on.

2. We will develop these ideas through **lab assignments introducing common tools and methods**, especially webmapping, the Global Positioning System (GPS), and Geographical Information Systems (GIS).

3. We will link tools and methods to **theoretical concepts in the field of geography** like scale, space/place, relationality, and neighborhoods. This aspect of the course will highlight the complex social and ethical implications of these technologies, particularly with regard to privacy, surveillance, and data ownership.

When you leave this class, you should have a sense of how modern digital maps are put together, an understanding of how geographic data is collected, processed and displayed, an overview of tools and processes used in web development (i.e. Github, HTML, CSS, JavaScript), and an apprecation of the possibilities and limitations of different types of geographic data. This is an introductory course in which no experience with geographic theory nor computer programming is expected. The class will not stand on its own for technical fluency in GIS or web development, but is a nice starting point for the **GIST Minor** (http://nature.berkeley.edu/advising/minors/gist).

Schedule

Please consider the schedule a living document, and check bCourses for any updates during the course.

Week of	Monday	Wednesday	Assignments
0: Aug 26	**NO CLASS**	Welcome + Orientation *	
1: Sept 2	**NO CLASS**	What is a Webmap?	Lab 0 (due 9/9)
2: Sept 9	Scale	Scale	Lab 1 (due 9/23)
3: Sept 16	Space (is the) Place I	Space (is the) Place II	
4: Sept 23	Projection & Location I	Projection & Location II	Lab 2 (due 10/7)
5: Sept 30	Distance & Time I	Distance & Time II	
6: Oct 7	GPS + Remote Sensing	**MIDTERM REVIEW**	
7: Oct 14	**MIDTERM**	Mobility + Simulation I	Lab 3 (due 10/28
8: Oct 21	Mobility + Simulation II	Territory/Region/Neighborhood	
9: Oct 28	Guest Lecture: TBA	Guest Lecture: TBA	Lab 4 (due 11/11)
10: Nov 4	Gerrymandering + Redlining I	Gerrymandering + Redlining II	
11: Nov 11	**NO CLASS**	Classification I	Labs 5 & 6 (due 12/2)
12: Nov 18	Classification II	Digital Labor	
13: Nov 25	Guest Lecture: The Future of Maps	**NO CLASS**	
14: Dec 2	Digital Governance	**FINAL REVIEW**	Final Exam (due 12/11)

* You will be given CAGE Lab access in the first lecture on **Wednesday, August 28.** Please bring your ID cards! Attendance here and in your first lab session the following week each make up 2% of your final grade.

Reading

The combination of technical and theoretical material covered in this course makes for a somewhat unconventional set of readings. Much of the "how-to" literature is online and changing constantly, and may be found scattered across sites like Github, StackOverflow, coders' personal websites, etc. It is highly likely, if not essential, that you will find your own sources to complement the basic details we include in lab instructions.

We will, however, make use of some core concepts in geographic theory throughout the course. Short readings will be assigned to supplement material covered in lectures and labs. You will be expected to use concepts and terms gleaned from these readings in your lab write-ups and contributions to the class Slack channel. They will also feature in the midterm and final exams. All readings will be provided via bCourses as assigned; no textbook is necessary for this course. That said, there are two books that we will draw from for many of our selections, and you may want to review them more thoroughly on your own:

- Kent, A. & P. Vujakovic P, eds. 2018. *The Routledge Handbook of Mapping and Cartography*. Routledge, New York. [fully downloadable via OskiCat]
- Peterson, M. 2014. *Mapping in the Cloud*. Guilford Press, New York. [accessible as an e-copy with 3 si multaneous readers or hard copy via OskiCat]

Course Websites

This course will use both **bCourses** and **Slack.** We will post readings, links to relevant materials covered in lecture, and syllabus updates on **bCourses**. Please make sure to receive bCourses alerts via email and/or in-app notification. All students are also expected to join the class **Slack** workspace (http://digitalworldsgeog80.slack.com), where you will post questions and help each other as the main component of your participation grade.

Assessment

This class is not graded on a curve; if you all pay attention in class, help each other in lab and online, and put in the work on your lab assignments and exams, we will be happy for everyone to receive high marks. Your final grade in this course will be composed of the following elements:

- 55% total across six Lab Assignments
- 10% for the Midterm
- 15% for the Final Exam
- 20% for Participation, including attendance at the first lecture (2%) and lab session (2%)

Lab Assignments

Each lab assignment is made up of a simple coding project and write-up fulfilling criteria described in detail in the instructions and/or grading rubrics on bCourses. Labs are designed for you to learn about digital worlds through doing: playing, testing, making, and generally experimenting with a range of webmapping techniques, platforms, and tools. While there will be a light emphasis on HTML, CSS, and open-source JavaScript mapping libraries, the hope is to demonstrate what tools are out there, rather than train experts in any individual method.

Each assignment will consist of written instructions and any data files necessary to build the map. The instructions will help you through major conceptual steps, but will leave room for you to figure out the details by yourself. This way, we hope, each new technology you work with will be more memorable when you come back to it.

In this spirit, CAGE Lab sessions will not be run as step-by-step tutorials, but as a block of time to focus, work together with peers, or seek support from course instructors. You may prefer working at odd hours, or from home or elsewhere; this is fine. After the first week, where attendance makes up 2% of your course grade, lab sessions are optional. You may find all the support you need online–in addition to resources you might discover on the web, we have set up a Slack channel for peer support. This channel will also function as the agenda for the start of each lab if common problems are expressed there. True to coding culture, helping and asking for help from your classmates is strongly encouraged. That said, final products must be your own individual work, as per the Academic Integrity Policy, referenced at the end of this document.

Lab assignments are due in bCourses by the Monday night indicated at 9pm PST unless otherwise announced. A completed assignment will require both the code needed to run your map/webpage, and a short write-up of what your digital output means and the context in which it was created. The write-ups are your opportunity to connect the theoretical points we learned in lecture and readings to the technical skills you're practicing in lab. Reflecting on making your map is as important as the output itself, so please be mindful of both!

Exams

The midterm (in-class) will consist of short-answer questions on materials covered in the first half of the course, as well as a code snippet and/or a webmap for you to analyze. The final exam (take-home) will consist of some short answers and one longer question. A significant portion of the final exam will reference your lab work (especially the final lab).

Participation

Because the lecture/lab format of this course doesn't allow for as much discussion across the class as we'd like, we are pushing the bulk of class participation into the digital realm. During the first lab period we will invite everyone to join a Slack team in which there will be channels for postings related to course lecture and reading content, technical support, and discussion questions. In general, we will grant full credit to all good-faith posts (this is a message board, not a peer-reviewed journal!), but if you dash off all your posts in the last week with little thought, you might lose points. In order to get full credit for participation, you will be expected to post to the group at least four of each of the following four categories (for a total of sixteen posts, making up 16% of your grade; feel free to post more though!):

- **Examples of course concepts.** Post an example with a few sentences describing why you think it's relevant to concepts we've covered in lectures and readings (e.g. current gerrymandering debates, location privacy leaks, new mapping techniques and labor practices, etc.). At least one of these posts should be a webmap; from a user's perspective, what does that map do particularly well? What might it do better?
- **Technical problems or solutions.** Having trouble in lab? Ask the Geog80 hive mind and maybe someone can help you! Or maybe you had a problem you solved yourself. Walk us through what got you stuck then how you found your way out–you just might be a superhero to a classmate struggling with a similar issue.
- **Discussion questions**. How does the lecture content relate to your work elsewhere in your major, or other parts of your life? What more do you want to know about? What other issues did we not have time to cover that you'd like to hear your classmates' thoughts about?
- **Responses.** Participation isn't just about talking; it's also about listening. You are expected to read the Slack regularly so you can meaningfully respond to your classmates' posts. What brilliant insights can you tack onto your classmates' brilliant ideas? Did you breeze through all the coding for this class or find an especially helpful tutorial online? Check the tech channel to see if there are any problems where you can offer support.

Technology Policy

This is a technical course. Computers are an important part of it. You will spend a lot of time on the Internet during this course, but you will all learn better if that time is spent working on your lab exercises, not idly browsing during lectures. Though research has shown handwritten notes to be the most effective for learning and recall, if this is not practical for you, please do not distract others with your use of technology during class.

University Policies

While most university policy regarding class conduct should be straightforward, please take a moment to review university policies here: https://sa.berkeley.edu/code-of-conduct Particularly important is the Academic Integrity policy, found here: https://sa.berkeley.edu/conduct/integrity

Here's a quick summary: everything you hand in should be your own work, produced for this class only. While we encourage collaborative problem solving for coding assignments, the end result should be clearly distinguishable as your own. The reality of coding is that you inevitably cobble things together from other working examples. However, there is an (albeit sometimes fuzzy) line between "stealing" and "altering" code to make it your own. This is an issue in the coding community at large. Ask us if you are unsure when/whether to cite someone else's work! Beyond code, you will likely need to cite other sources (mostly texts and datasets) in your maps and write-ups. Cheating/plagiarism will receive a "0" on the assignment + disciplinary action, so if you are unsure about something, please ask!

Special Accommodation / Accessibility

If you have a conflict with a test or class activity due to religious creed or need special accommodation to fulfill course requirements via the Disabled Students Program (DSP: https://dsp.berkeley.edu/), please contact us immediately so we can work something out. If you do not yet have DSP support but are considering applying for services, please do so as soon as possible well before major assignments are due. For illnesses and other personal issues, please make healthy decisions (e.g., stay home if you have the flu, prioritize urgent family commitments, etc.), but tell us as soon as possible if this will impact your progress in the course. We are here to help you succeed to the best of your ability as an individual. If there are other questions or problems that come up not covered above, please come to us and we will try to find a solution and/or point you to campus resources that can help. TL;DR is to be honest and communicate early when possible!

Welcome to the course!