XSAVI-800: Advanced Interactive Web Mapping, Programming, and Design

Pratt Institute, ISC Building 006
Mondays and Wednesdays 6:00pm – 9:00pm
Eric Brelsford, Instructor
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Course Overview

This course will build upon the concepts learned in XSAVI-780, Introduction to Interactive Web Mapping, Programming and Design. In the previous class you used HTML, CSS, and JavaScript to create interactive online maps. This course will push your knowledge of these technologies in order to gain access to more data, collect data, and make more interactive maps. By the end of the course you will have a working knowledge of using and creating Leaflet plugins, using APIs, and working collaboratively on code-based projects.

Equipment and Software

Students should bring to class the computer they intend on using for web development. Mac, PC, or Linux machines are all welcome. Students will be required to use a code editor such as Sublime Text, TextMate, or gEdit for development. We will install any other necessary desktop software, libraries, or frameworks as needed.

Class Format

Each class will consist of lecture interspersed with in-class assignments. We will spend roughly one half of class in lecture, introducing new concepts, and the remainder on the lab portion, where you will apply the new concepts. There will be roughly five out of class assignments, one weekly for the first five weeks, and a final project due at the end of class.

Attendance

Barring illness or an emergency, students are required to attend all classes. If you will not be able to attend class for any reason, please let the instructor know as soon as possible. Unexcused absences will adversely impact your grade in this course.

Course Homepage

All slides, in-class assignments, out-of-class assignments, and other resources will be posted to the course homepage (http://ebrelsford.github.io/talks/2016/SAVI/800/) throughout the session. It is your responsibility to check this page for assignment descriptions and due dates. You are welcome to open the slides and follow along with them during class.

Contacting the Instructor

When contacting the instructor, please only use the instructor's email address (above) for personal situations such as when missing class or an assignment. If you have a technical question or a clarifying question about an assignment, please use the Google Group (savi800-spring2016@googlegroups.com) for the course. Technical questions and questions about assignments tend to be common (you won't be the only one asking the question), and this is also an opportunity to help a fellow classmate if you know the answer to the question.

When emailing about a technical issue, please include a specific description of the problem you are experiencing and code that shows this issue using an online code-sharing service.

Final Project

Students will submit and present a final interactive web mapping project on the topic of their choosing during the final class session. This project must be hosted online publicly, include an interactive map, use good design and user interface practices, and have well-commented, well-written code. Students will use the final class to present their project and their code in detail. A brief (less than one page) write up of the project idea and execution should be included with the final project.

Proposed topics should be submitted to the instructor by end of class on April 20th.

Grading

Students will be assessed for the quality of their assignments (50%) and final project (40%), and for class attendance (10%). While final grades are subject to interpretation by the instructor, grades will generally be assigned in the following manner:

- **High pass**: Completion of all assignment and final project at a high level of quality. Full attendance.
- **Pass**: Completion of all assignment and final project at a moderate level of quality. Full attendance.
- **Low pass**: Completion of more than 75% of assignments and the final project at a passing level of quality. Near full attendance.

Failing grades, while rare, are possible in the course. They will be given for 1) unexcused absences from more than 2 classes, 2) completing fewer than 75% of the in-class assignments, or 3) failure to complete the final project.

Detailed Course Schedule

Please note that the following course schedule is subject to change given the needs of the students. The outline below is a projection of the topics the instructor believes the class will cover over the duration of the class, but topics may be added or removed as necessary.

Detailed assignments will be given over the course of the semester, the outlines presented here are purely to give you an idea of what will be covered in each.

Class 1: Refreshers and CartoDB

March 21, 2015

- Introductions
- Course syllabus
- Refreshers: HTML, CSS, and JavaScript
- Introduction to CartoDB

Class 2: Using CartoDB's APIs

March 23, 2015

- SQL
- PostGIS
- Leaflet + CartoDB

Assignment 1: Using the CartoDB SQL API

Using the CartoDB SQL API create a webpage that:

1. Displays the output of an SQL query. Do not use a map for this, rather display the data in a table or as a chart.
2. Loads data as GeoJSON and displays it on a Leaflet map.
3. Dynamically lets the user change some aspect of the SQL queries being used.

Class 3: Other APIs / Getting Data by Other Means

March 28, 2015

- City APIs (geoclient)
- Census API
- Instagram
- Foursquare
- OSM
- Valhalla
- Let's get our hands on more data
    - Using developer tools to find endpoints
    - OpenRefine

Class 4: CartoDB.js

March 30, 2015

- Creating maps with CartoDB.js

- Accessing Leaflet through CartoDB.js

Assignment 2: Using CartoDB.js

1. Add a CartoDB map to a webpage using CartoDB.js.
2. Add an event handler to the map that loads data from your CartoDB tables using the SQL API.

Class 5: Leaflet Plugins

April 4, 2015

- Using Leaflet plugins through Leaflet
- Using Leaflet plugins through CartoDB.js

Class 6: More Leaflet Plugins

April 6, 2015

- Leaflet's class structure
- Hooks
- Writing your own Leaflet plugin

Assignment 3: Working with Leaflet Plugins

Create a map using a Leaflet plugin that you haven't used before.

Class 7: Collaborative Coding with Git and GitHub

April 11, 2015

- Leaflet's class structure
- Hooks
- Writing your own Leaflet plugin

Class 8: Client-side GIS with Turf

April 13, 2015

- Turf.js
- Using Turf with Leaflet

Assignment 4: GitHub and Turf

1. Use Turf to perform a spatial operation on some GeoJSON data and show the results using Leaflet.
2. Use CartoDB to display similar results to the map you created in the previous part.

Class 9: Mapbox

April 18, 2015

- Mapbox Studio
- mapbox.js

Class 10: Other way to make client-side maps

April 20, 2015

- Tangram
- D3

Assignment 5: Mapbox Studio and Data

Create a custom style using Mapbox Studio, upload it to Mapbox, and display it on a webpage using mapbox.js.

Class 11: Collecting data

April 25, 2015

- Google Forms
- Backends
    - GeoDjango
    - Node

Class 12: Special Topics / Final Project Work Session

April 27, 2015

Class 13: No Class / Special Topics

May 2, 2015

- The Instructor will be out of town this week for a conference. We will discuss alternatives to meeting.

Class 14: No Class / Final Project Work Session

May 4, 2015

- See Class 13.

Class 15: Final Project Presentations

May 9, 2015

- Students will present their final projects and code to the class.