Geography 5201: Web-Based GIS

The Ohio State University

Spring 2015

Lecture/lab: 0140 Derby Hall, Mo We 11:10 AM - 12:30 PM
Course URL: http://carmen.osu.edu

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Office Hour: Friday 1:00 - 2:30 PM or by appointment

The Internet has fundamentally changed the way of computing. The combination of geographical information technologies and the Web has become ubiquitous in applications from daily travel planning to complex natural resource management. The major goal of this course is to help students understand the design and implementation of web-based GIS for different purposes. We will survey a variety of enabling web-based techniques for spatial data management and processing, geographical knowledge representation, and mapping. A wide range of web-based GIS applications will be discussed. This course also includes hands-on lab exercises. After taking this class, students should establish a broad understanding of web-based GIS and will be able to create GIS applications using various techniques.

Text

There is no required text for this class. But I recommend the following books that are highly relevant to this class.

M. P. Peterson. 2014. *Mapping in the Cloud*. The Guilford Press.
J. Bennett. 2010. *OpenStreetMap*. Packt Publishing.
A. DuVander. 2010. *Map Scripting 101: An Example-Driven Guide to Building Interactive Maps with Bing, Yahoo!, and Google Maps*. No Starch Press.
P. Fu. 2011. *Web GIS: Principles and Applications*. Redlands, CA: ESRI Press.
Erik Hazzard. 2011. *OpenLayers 2.10 Beginner's Guide*. Packt Publishing.
Z.-R. Peng and M.-H. Tsou. 2003. *Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Network*. New York: Wiley.
Antonio Santiago Perez. 2011. *OpenLayers Cookbook*. Packt Publishing.

A number of reading materials will be used for lectures and class discussion.

Prerequisites

Geography 5200, 5220 or consent of instructor is required. Students should have a good understanding of geospatial data.

Activities

Student performance is assessed based on the following three components:

- **Labs**. (30%) We will have eight weekly labs. Each lab assignment is typically due before the next week's lab starts. A significant amount of points will be deducted if lab reports are submitted late.
- **Projects**. (35%) Each student can work in individual or group (no more than 2 members) to complete an appropriate project that uses some of the techniques learned in this class. Students are responsible for collecting data and implementing the idea. Each project has a few deadlines to follow. These deadlines are listed in the last column in the course schedule page.
    - Proposal. Each individual or group must submit a formal proposal of no more than 500 words discussing in detail about their project. Revisions may be required after I review the proposals.
    - Early report. The purpose of an early report to encourage each group to start early so that they can overcome potential technical barriers that often appear in this stage of a project. This report should include a detailed description of the data to be used and a sound technical/methodological framework. **Each project must have at least a prototype** (meaning a system that is real but not fully functioning) of the final product in the early report.
    - Demonstration. Each individual/group will demonstrate their project (live!) during the scheduled date and time.
    - Final report. This report concludes a project and should include the final discussion about the implemented functions/services in the original proposal. Some self-assessment as well as limitations should also be discussed.
- **Participation.** (20%) There are three components in the participation of the class.
    - Attendance. It is important for each student to attend the class. Attendance will be occasionally taken during the semester.
    - Reading and tutorials. Each student must sign up to either lead a discussion about a paper or to be part of a tutorial team. Students failed to participate in these activities will not pass this class.
        - Discussion. A student can sign up to lead a discussion on a paper as listed in the course schedule. Discussions will generally focus on the papers. Each student signed up for this will make a presentation to the class to discuss the main points of the paper. I have tentatively listed some articles for discussion. However, it will be great if each student can choose other articles.
        - Tutorials. There are some sessions that do not have particular papers to read. Instead, these are tutorial projects that require some hands-on experiments on online mapping software. Students sign up as a team to learn the technique and make a how-to presentation to the class so that other students can follow the tutorial and know the techniques/tools too. There are two web site tutorials, for KML and OSM (OpenStreetMap), and two software groups. I did not specify any software tools to work on, and each group will choose, maybe, from the following mapping tools: CartoDB, CloudGIS, GeoCommons, MangoMap, ArcGIS Online/Server, and MapBox. (There are more tools out there and our choices should be not limited by this list.) These tools are either free or have some free versions/services. Each tutorial group must (1) write up a tutorial document that allows other students to follow their steps, and (2) present the tutorial in a hands-on fashion during the class specified in the course schedule.
- **Quizzes**. (15%) There will be a few quizzes during the semester. The date of each quiz will be announced prior to the date of the quiz. It is very important to do well on quizzes. **Your final grade will not exceed the grade of the quizzes.** For example, if received 92% in the

total of all the quizzes, your quiz grade is A- and your final grade for the class will not be higher than A-. The standard OSU grading scheme will be used for grading the points.

Requirements

It is important to note that all documents must be prepared in HTML (using a reasonably good style) and must be submitted as required in each specific instruction. **NO WORD DOCUMENT OR ANY OTHER FORMAT WILL BE ACCEPTED.** All other formats will receive zero point. No email submissions.

Late papers. I will not accept any make-ups for in-class exams and exercises or quizzes. Exceptions may be granted in cases such as serious illness, family emergency, or career opportunities, but only if requests were made before the class or the missed event starts.

Students must have good work ethics when working on their group projects. Complaints can be expressed before the due date of the final report. Students who failed to improve their work ethics may receive zero point for their projects.

Schedule

A tentative schedule is available online (link here); students should check the schedule page frequently as new materials will be made available every week. The schedule is subject to changes during the course of the semester.

Important Issues

- **Students with Disabilities:** I would like to hear from anyone who has a disability that may require some modification of seating, testing, or other class requirements so that appropriate arrangements may be made. Please talk with me after class or during my office hours. If you need more information about disabilities and accommodations, contact the Office of Disability Services.
- **Policy on Plagiarism and Academic Misconduct:** In the Code of Student Conduct, academic misconduct is defined as "any activity that tends to compromise the academic integrity of the university, or subvert the educational process"; plagiarism is defined as "the representation of another's work or ideas as one's own; it includes the unacknowledged word-for-word use and/or paraphrasing of another person's work, and/or the inappropriate unacknowledged use of another person's ideas." **Plagiarism is wrong and should be prohibited.** The University has a policy on academic misconduct and plagiarism, as provided in the Code of Student Conduct. To further understand this, it is worthwhile to read the Eight Cardinal Rules of Academic Integrity at http://www.northwestern.edu/uacc/8cards.html and guidelines to avoid plagiarism at http://www.northwestern.edu/uacc/plagiar.html.