

DRAFT: SUBJECT TO CHANGE

The World & Big Data

GEOG 281 Winter 2019

Instructor: Dr. Henry Hui Luan

Course meetings: 206 Condon Hall, Mondays & Wednesdays, 10am–11:20am

Office: 275 Condon Hall

Office hours: Thursdays 1:30pm-3:30pm OR by appointment

Course Description

Today's world is driven by data. Political, economical, and environmental decision-making is increasingly dependent on big data sets. Services like Google personalize what you see and advertise upon data about you and 'customers like you'; social media allow the public to directly and proactively participate in activities such as urban planning, disaster reporting, and humanitarian interventions.

"80% of data is geographic" (Morais, 2012). While this statement is arguable, real-world datasets are geographically and temporally referenced when they are collected by devices with location-aware sensors such as the Global Positioning System (GPS) receivers, mobile phones, and vehicles. Technologies such as wireless local area networks (WLAN) make it feasible to collect georeferenced data within the indoor environments. The increasing volume and varying formats of these big spatial datasets have posed new challenges in data storage, management, process, analysis, visualization, and quality control. Ethical and geo-privacy issues have also emerged in recent applications of big data techniques in tracking human activities.

This course will introduce relevant concepts (e.g., 5 V's) and techniques (e.g., cloud computing) of big (spatial) data as well as its applications in the real world, such as building smart cities as well as disaster management. The students will also have hands-on experiences on contributing Volunteered Geographic Information (VGI, e.g., creating and uploading geographic information to Open Street Map), collecting GPS data via mobile apps, retrieving social media data associated with location (e.g., "geo-tagged" Tweets), etc.

Textbooks

1. (Optional) V. Mayer-Schönberger and K. Cukier. *Big data: a revolution that will transform how we live, work, and think*. Eamon Dolan/Mariner Books, 2014.
2. (Optional) P. Meier. *Digital Humanitarians*. CRC Press, 2015.

Learning objectives

After completing this course, the students are expected to:

- Understand the unique characteristics of big data
- Be familiar with the techniques used for collecting, storing, managing, processing, analyzing, and visualizing big data
- Know how big data can solve real-world problems
- Grasp basic skills to contribute/retrieve spatial datasets

Grading

In-class activities	15 pts
Assignments	45 pts
Midterm exam	15 pts
Final exam	25 pts

Notes:

- Late assignments will receive a deduction of 10% per day including weekends and holidays. Assignments submitted 7 days later than the deadline will NOT be accepted. The only exception is when you can provide a university-approved excuse.
- All times are based on Pacific Standard Time (PST).

Academic Integrity Code

All students are expected to complete assignments in a manner consistent with academic integrity. Students must produce their own work and properly acknowledge and document all sources (ideas, quotations, paraphrases). Students can find more complete information about the University of Oregon's Policy on Academic Dishonesty in the University of Oregon Student Handbook. **If you are found to have plagiarized (copied) off a classmate or from other materials for a test or an assignment of any sort, your first warning will be a zero on the assignment. Your second incident will result in an F in the course.**

Accessibility Statement

The University of Oregon is working to create inclusive learning environments. Please notify me at the beginning of the term if there are aspects of the instruction or design of this course that result in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or uoaec@uoregon.edu.