

Spring 17 - GEOG 4/572

GeoVisualization: Geovisual Analytics

# Introduction

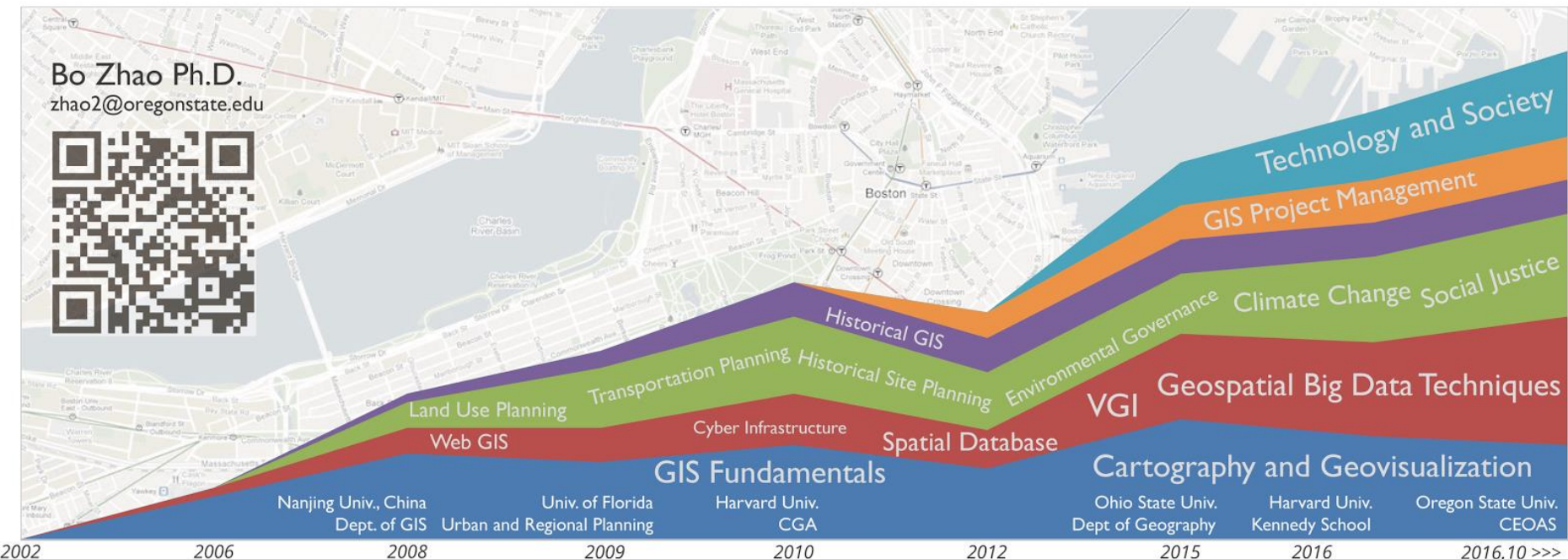
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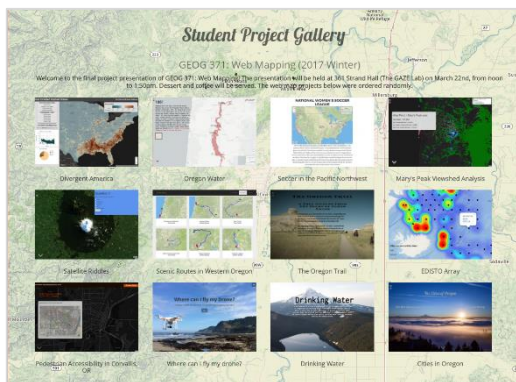
Bo Zhao Ph.D.  
zhao2@oregonstate.edu



## Teaching:

My goal is to help students efficiently and friendly communicate with the targeting audience using geovisualization.

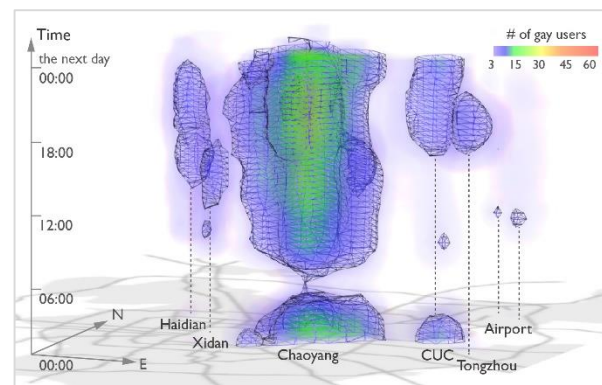
- Geog 371: Web Mapping ([a lab assignment demo](#))
- Geog 472/572: Geovisual Analytics



Former Student Project Gallery

## Current Research:

- Location-based Social Media;
- [Storymap.js](#) – a open source map storytelling library
- [Carto](#) – a geospatial big data platform



Visualization LGBT community in Beijing



# Student Project Gallery

## GEOG 371: Web Mapping (2017 Winter)

Welcome to the final project presentation of GEOG 371: Web Mapping! The presentation will be held at 361 Strand Hall (The GAZE Lab) on March 22nd, from noon to 1:50pm. Dessert and coffee will be served. The web map projects below were ordered randomly.



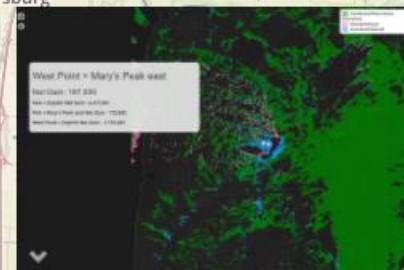
Divergent America



Oregon Water



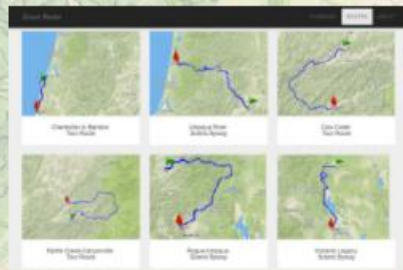
Soccer in the Pacific Northwest



Mary's Peak Viewshed Analysis



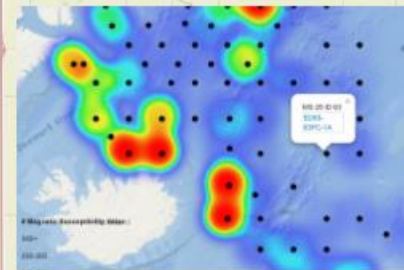
Satellite Riddles



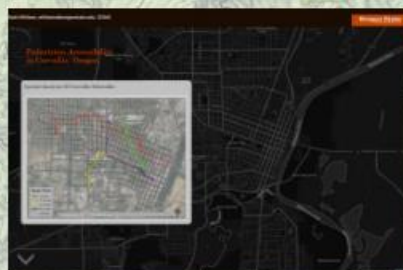
Scenic Routes in Western Oregon



The Oregon Trail



EDISTO Array



Pedestrian Accessibility in Corvallis, OR



Where can I fly my drone?



Drinking Water



Cities in Oregon

Now, why are you here ...?

So, why study geovisual analytics?

Instructor:	Bo Zhao, <a href="mailto:zhao2@oregonstate.edu">zhao2@oregonstate.edu</a>
	Office Hours: 1500-1600 T or by appointment @347 Strand Ag Hall
TA:	Kyle R. Hogrefe, <a href="mailto:hogrefek@oregonstate.edu">hogrefek@oregonstate.edu</a>
	Office Hours: TBD @257 Wilkinson
Text:	No required text. Required papers and online materials will be available on the course website.
Credits:	3
Meeting:	Lecture: TR 0900 - 0950 @LINC 368; Lab: T 1800 - 1950 @Wilkinson 210
Prerequisites:	GEOG 370 or GEOG 371
Grades:	Letter grading (A to F)

# Canvas + GitHub

The screenshot shows the GitHub repository page for `jakobzhao/GeovisualAnalytics`. The repository is titled "Geovisualization Course: Geovisual Analytics @ Oregon State University". It has 27 commits, 1 branch, 0 releases, and 1 contributor. The repository is licensed under LGPL-3.0. The repository is currently on the `master` branch. The repository is public and has 1 star and 0 forks. The repository is created by `jakobzhao` on GitHub. The repository contains the following files and folders:

File/Folder	Description	Time
<code>project</code>	Add files via upload	11 hours ago
<code>wk01</code>	Add files via upload	a day ago
<code>LICENSE</code>	Initial commit	14 days ago
<code>readme.md</code>	Add files via upload	a day ago

The `readme.md` file contains the following text:

Spring 2017 | Geography 472/572 | Geovisualization: Geovisual Analytics

Instructor: Bo Zhao, [zhao2@oregonstate.edu](mailto:zhao2@oregonstate.edu) | Office Hours: 3-4pm T or by appointment @347 Strand

TA: Kyle R. Hogrefe, [hogrefek@oregonstate.edu](mailto:hogrefek@oregonstate.edu) | Office Hours: TBD @257 Wilkinson

Lecture: TR 9-9:50am @368 LINC | Lab: T 6-7:50pm @210 Wilkinson

Catalog Course Description: GEOVISUALIZATION III: GEOVISUAL ANALYTICS (3). Concepts and techniques underlying the production of maps by computer. Practical experience with a variety of computer mapping packages.

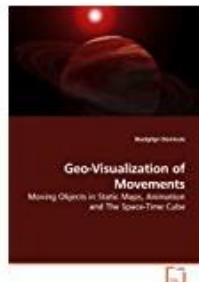
<https://github.com/jakobzhao/GeovisualAnalytics>

# Texts

No required textbook. Required papers and online materials will be available on canvas.

Your search "**geovisualization**" did not match any products.

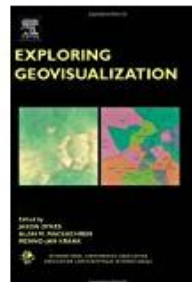
Did you mean: "[geovisualization](#)"



[Geo-Visualization of Movements: Moving Objects in Static Maps, Animation and The Space-Time Cube](#) Apr 16, 2010  
by Biadgilgn Demissie

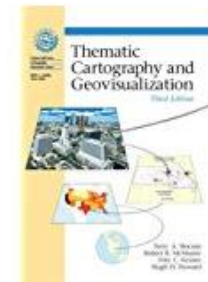
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[Exploring Geovisualization \(International Cartographic Association\)](#) Feb 10, 2005  
by J. Dykes, A.M. MacEachren and M.-J. Kraak

~~\$250.00~~ **Kindle Edition**



[Thematic Cartography and Geovisualization, 3rd Edition](#) Apr 14, 2008  
by Terry A. Slocum, Robert B. McMaster, Hugh H. Howard and Fritz C. Kessler

~~\$197.63~~ to buy **Prime**  
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# Syllabus

WK	LECTURE (T)	LAB (T)	LECTURE(R)	PROJECT
Wk 1	Intro to GeoViz	Brainstorm	Geovisualization Presentation	Introduction
Wk 2	Web Mapping Architecture (Internet Structure, Map Services)	Web Programming Basics (JS, HTML, CSS, and GitHub, etc.)	Web Mapping Basics (leaflet.js)	Team-up
Wk 3	Virtual Globe (Cesium.js)	Interactive GeoViz (geospatial data operation, storymap.js)	Layout (figure/ground, visual components)	Proposal
Wk 4	Symbolization (Illustrator, Icons)	Cont'd (Interface Design)	Color	Sketch & Project Summary
Wk 5	Topography and Labelling (Google font, Mapbox font)	Base Map Design: (Mapbox)	Data Interaction I (D3.js)	Design Scheme (Color, label, icon, and multimedia, etc.)
Wk 6	Data Interaction II	Cont'd	Map Critique	Revision
Wk 7	Real-time mapping (e.g., Twitter API, Weather API)	Data Driven Maps	Heatmap (visualizing real-time geospatial data)	Coding
Wk 8	Cartogram	Cont'd	Network Visualization	Coding
Wk 9	UAV Mapping	Fieldwork with UAV	Virtual Reality (in GAZE Lab)	Fine-tuning
Wk 10	Emerging Topics in GeoViz	Project Q&A	Project Presentation	Presentation



# Learning Objectives

Learning Objectives	Assessment
Consistent with geospatial science (G1 to G3) learning outcomes of the BS degree in Geography and Geospatial Science. Elements specific to this course are shown in learning outcomes 4 to 7.	
G1. Recognize and use basic spatial and cartographic concepts (e.g. scale, projection, and coordinate systems), as well as statistical and surveying principles.	Quizzes
G2. Demonstrate facility in the classification and analysis of geospatial data (e.g. satellite images, digital maps and their associated tabular datasets) and the ability to use geographic information science technology (software, data collection instruments and devices).	Labs
G3. Develop and integrate spatial thinking and the capacity to create visualizations (e.g. images, maps, diagrams, charts, 3D views) of spatial phenomena, including those illustrating natural and human systems and their interactions.	Map Critique, Project
Describe and interpret basic concepts of geovisual programming, create interactive maps using web map libraries.	Labs
Apply cartographic design principles, basic layout and typography principles. Describe and explain color perception, color models and color management.	Quizzes, Labs
Demonstrate a working knowledge of programming for web or mobile devices, including interactive 2D or 3D mapping frameworks, e.g., Leaflet, Cesium.	Labs, Project
Critically assess maps and identify design errors.	Map Critique, Labs
Additionally, graduate students should be able to:	
Interpret some advanced geovisual analytical methodologies, e.g., cartogram, network, UAV Mapping etc.	Presentation
Geo-narrate studies in geography using geovisual analytical tools.	Project
Coordinate a small-size research team to make a geovisual application.	Project

# Grading

Item	Description	% of Final Grade	
		GEOG 472	GEOG 572
Participation	Most classes have time allotted for discussions, in-class work and other activities.	10	10
Quizzes	3 in-class and/or take-home quizzes covering topics from lecture and reading assignments.	15	15
Labs	2 lab assignments (15% each). We understand that many of the programming techniques discussed early in the course will be relatively new. Recognizing this, the first few assignments will contain more detailed instructions.	40	30
Project Development	Students are expected to make concrete contribute to the final project. It could be the proposal, the introduction page, an interactive feature, animation, color scheme, symbolizations or etc.	15	30
Project	Each student is required to collaboratively work on a final project using geovisual analytics. Each student group will make a presentation to demonstrate their work. This final project is mainly evaluated by both the presentation and the quality of the geovisual application.	20	15
TOTAL		100	

# Before next lecture, please...

- Read the Course Project: Brainstorm:

<https://github.com/jakobzhao/GeovisualAnalytics/blob/master/project/brainstorm.md>, and finish the homework.

- Apply a GitHub Account, and watch the course repository at

<https://github.com/jakobzhao/GeovisualAnalytics>

- Working on the reading list of week one.

<https://github.com/jakobzhao/GeovisualAnalytics/blob/master/wk01/readme.md>

Any questions?