INFORMATION VISUALIZATION E483/E583 (3 Credits)

All instruction for this course is provided online via Canvas. New materials are released each Monday morning, all graded activities need to be submitted by the subsequent Sunday unless stated otherwise.

INSTRUCTORS

Dr. Katy Börner (https://info.sice.indiana.edu/~katy/)

Michael Ginda (http://cns.iu.edu/current_team/bio/michael_ginda.html)

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COURSE RATIONALE

This course aims to improve data visualization literacy—the expertise and skills needed to read and make data visualizations. It teaches theoretical foundations and advanced tools that help turn data into insights.

COURSE DESCRIPTION

The visual representation of information requires a deep understanding of human perceptual and cognitive capabilities, data mining and visualization algorithms, interface and interaction design, as well as creativity. Data—such as twitter, books or social networks—is typically non-spatial and needs to be mapped into a physical space that represents relationships contained in the information faithfully and efficiently. If done successfully, data visualizations combine human and machine intelligence to solve tasks that neither could accomplish alone.

This course provides an overview about the state-of-the-art in information visualization. It teaches the process of producing effective temporal, geospatial, topical, and network visualizations. Students get the chance to use tools such as OpenRefine, Tableau, and Gephi. Students have the opportunity to collaborate on real-world projects for a variety of clients.

Specifically, the course covers:
- visualization frameworks that guide development,
- data analysis algorithms that enable extraction of structures and trends in data,
- major visualization and interaction techniques,
- discussions of systems that drive research and development, and
- trends, opportunities, and challenges in the field.

LEARNING OBJECTIVES

The course objective is to provide students with a working knowledge of how to effectively visualize abstract information and hands-on experience in the application of this knowledge to specific domains, different tasks and diverse, possibly non-technical users. It is a graduate-level course that utilizes a combination of lectures, hands-on demonstrations, (online) discussions, and projects. The course requires about 8 hours of work each week. Students are expected to process weekly materials, to complete self-tests and homework, to actively participate in the (online) discussion, and to work in teams on the final client project.

PREREQUISITES

There are no prerequisites. Students from any area of scholarly endeavor are welcome to enroll.

RESOURCES

Readings are readily available through the IU Libraries or on the web. Any specialized materials will be available through Canvas (http://canvas.iu.edu).

PLAGIARISM

Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source, for either written or oral use, must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.

A student must give credit to the originality of others and acknowledge indebtedness whenever:

- directly quoting another person's actual words, both oral and written;
- using another person's ideas, opinions, or theories;
- paraphrasing the words, ideas, opinions, or theories of others, both oral and written;
- borrowing facts, statistics, or illustrative material; or
- offering materials assembled or collected by others in the form of projects or collections

Academic and personal misconduct by students in this class are dealt with according to the http://studentcode.iu.edu. Sanctions for plagiarism can include a grade of F for the assignment in question and/or for the course and must include a report to the Dean of Students Office.

LATE HAND-IN POLICY

Late hand-ins or incomplete hand-ins are allowed only because of an unforeseen emergency that is preceded by diligent work, not for a pattern of weak performance. No individual student will be allowed to do extra work to raise the final grade or to make up missing work. All grades become final one week after the material is returned. Make sure to submit work on time and confirm that programs/webpages work.

STATEMENT FOR STUDENTS WITH DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides reasonable accommodation for their disabilities. If you believe that you have a disability requiring an accommodation, please contact IU Disability Services for Students (http://www.indiana.edu/~ada/resources_IUB.html).

GRADING

Final grade is based on

- Data Visualization Literacy Quizzes (20%)
- Make-A-Vis Tasks (20%)
- My Visualization Project (20%)
- Group Client Project (30%)
- Participation (10%)

Definitions of Letter Grades:

- A 4.0 [95 to 100 points] Outstanding achievement. Student performance demonstrates full command of

the course materials and evinces a high level of originality and/or creativity that far surpasses course expectations.

- 7 [90 to 94.5] Excellent achievement. Student performance demonstrates thorough knowledge of the course materials and exceeds course expectations by completing all requirements in a superior manner.
- B+ 3.3 [87 to 89.5] Very good work. Student performance demonstrates above-average comprehension of the course materials and exceeds course expectations on all tasks as defined in the course syllabus.
- B 3.0 [84 to 86.5] Student performance meets designated course expectations and demonstrates understanding of the course materials at an acceptable level.
- B- 2.7 [80 to 83.5] Marginal work. Student performance demonstrates incomplete understanding of course materials.
- C+ 2.3/C 2.0 [77 to 79.5] Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course materials.
- 7 / D+ 1.3 / D 1.0 / D- 0.7 Unacceptable work. Coursework performed at this level will not count toward the MLS or MIS degree. For the course to count toward the degree, the student must repeat the course with a passing grade.
- F 0.0 Failing. Student may continue in program only with permission of the Dean.

RESOURCES

- *Visual Insights*: Located in both the Herman B. Wells Library and the Swain Hall Library at call # QA76.9.I52 B67 2014. A copy of this book will be on reserve in the Wells In addition, an eBook version can be accessed at: http://site.ebrary.com/lib/iub/detail.action?docID=10829849. (Links to an external site.) However, it can only be viewed one person at a time.
- *Atlas of Science*: Located on the 2nd floor of the Wells Library in the Government Information section with the call # Q177.B67 2010. A copy of this book will be on reserve in the Wells Library.
- *Atlas of Knowledge:* Currently this book is on reserve in the Wells Library and this is the only means of accessibility at this time. Part 2 of the book that details the visualization framework is freely available as a pdf file as part of course materials.