Name: Syllabus for IS 608 - Knowledge and Visual Analytics

Description:
In this course students will learn non-statistical aspects of elucidating from data its information content which leads to knowledge. Several differing visual techniques will be examined to gain this knowledge through exploratory use of visualizations as well as visualization techniques for presenting data to a variety of stakeholders. Exploratory techniques look to find patterns in the data. Finding patterns that underlie the system's characteristics when the data sets are very large or have many dimensions by reducing the dimensionality in intelligent ways is a complex task that often includes user direction. Presentation visualizations provide the viewer with useful information and knowledge since the visualizations are created with context in mind.

This course will be completed completely online: assignments will be issued most weeks and due before the next class begins. **One larger visualization project will be completed at the end of the course and will be displayed on a public website**.

Pre-requisites: IS 602 and IS 607

Course objectives: At the completion of this course, students should be able to:

- Understand the principles of data visualization
- Apply these principles in both interactive and status graphics
- Demonstrate familiarity with several modern data visualization tools and libraries
- Efficiently create visualizations for diagnostics and analysis

Instructor:
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I will be available via email and cell as much as possible, though it may occasionally take me 24 hours to get back to you, so please ask questions early! I will be holding office hours every Tuesday evening, where I will be available to help you work through issues either via Skype or in person if you are able to get to the Baruch Library. I encourage you to contact me at my gmail address.

Grading:
You will be graded on your understanding of the theory of data visualization, your presentation of information, and how you apply the tools we will be using the course (code quality, etc.).

Each homework assignment will be worth 10% of your overall class grade, with your lowest score being dropped. Late projects will be docked 1% of your overall class grade for each day late. Additionally, there will be a small quiz at the beginning of most classes which will be worth 2% of your final grade, with your two lowest scores being dropped. The breakdown of points available over the course will be as follows:

Homework Assignments: 50%
In-class quizzes: 10%
Final Project: 40%

Students are encouraged to discuss approaches to homework assignments together, and I expect many of you to take similar approaches to visualization, though you each must turn in your own work, and it should have been completed solely by you. However, the final project will be done individually. There will be no requirement for online participation, but you are encouraged to ask questions, and students that make an effort to engage with and help other students will be awarded up to 10% of additional credit at the instructor's discretion.

The only reason students have failed this course in the past is that they did not put enough thought into their Final Projects and their rights to the data they were working with and did not communicate issues to me in a timely manner.

Textbooks: There is no textbook for this course: readings will be linked to or distributed by your instructor.

Hardware, Software, and Network Requirements: You should have network access every other week at meetup times. You should also have a computer on which you can save software and different files.

Academic Integrity & Netiquette: I expect that you will honor the principle of academic integrity. This means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. I strongly encourage you to look for help on coding problems from the internet (StackOverflow, etc) but that you will not blindly copy & paste code found on such sites. Constructive criticism of your fellow students (and of me and the class) is encouraged. It should go without saying that bullying and intolerant speech will not be tolerated.

Assignments & Schedule: Reading and Homework assignments are listed below in the class-by-class schedule below.

Meeting (**6:45PM**)	Lecture	Quiz	What's Due	Reading	New Assignment
2/9/2016	Introduction and Principles of Visualization Design: How to Keep Astronauts Safe	Intro Questions (0 points)	Nothing	Tamara Munzner's 'Visualization Principles' & ggplot2 documentation	Principles of Data Visualization & Intro to ggplot2
2/23/2016	Eating Your Own Dogfood: Visualization in the Feedback Loop	Viz Design	Principles of Data Visualization & Intro to ggplot2	Hadley Wickham's Intro & BigVis Presentation	Data Visualization & Refinement with R & ggplot2
3/8/2016	Advanced Dogfood Eating: Interactive graphics from R with Shiny and GoogleVis	ggplot2	Data Visualization & Refinement with R & ggplot2	Intro at http://trestletechnology.net/wp-content/uploads/2013/02/shiny_introduction.pdf	Interactive Graphics with R
3/22/2016	Snake Eyes: Seeing Your Data With Python	Interactive Graphics	Interactive Graphics with R	Matplotlib and pyplot documentation http://matplotlib.org/api/pyplot_api.html	Python
4/5/2016	Enough JavaScript to be a Menace to Yourself and Those Around You	Python	Python	Crockford Essay http://javascript.crockford.com/survey.html Adobe's Intro http://www.adobe.com/devnet/html5/articles/intro-to-javascript-for-the-total-beginner.html	JavaScript Primer & Node Install
4/19/2016	Play it Again: Google Charts API and Visualizing Data Using JavaScript	JavaScript	JavaScript Primer	None	Google Charts API & Proposals for Final Project
5/3/2016	Tune Up & Push Out: Additional Considerations	Visualizing Data with JavaScript	Google Charts API & Proposals for Final Project	Scott Murray's D3 Tutorial http://alignedleft.com/tutorials/d3	None
5/17/2016	Final Projects and Advanced Topics	D3	Final Project	None	None