CMPT 767 - G100 Visualization

Instructor(s): Steven Bergner

Calendar Objective/Description:
Advanced topics in the field of scientific and information visualization are presented. Topics may include: an introduction to visualization (importance, basic approaches and existing tools), abstract visualization concepts, human perception, visualization methodology, 2D and 3D display and interaction and their use in medical, scientific, and business applications.

Instructor's Objectives:
The course is targeted both towards students interested in using visualization in their own work, as well as students interested in building better visualization tools and systems.

Course-specific goals -- students can:
- represent and interact with various types of data visually
- evaluate visual depictions of data and possibly find improved presentations
- assist users in visual data analysis
- use different visual analysis tools, like Tableau
- create interactive web-visualization environments

General goals -- students gain:
- insight into a new discipline and extend their scientific horizons
- an appreciation for the interplay of mathematical analysis and user-centered design
- experience working in a team

Prerequisites:
CMPT 316, 461 or equivalent (by permission of instructor). Students with credit for CMPT 878 or 775 may not take this course for further credit.

Topics:
- Visual design principles and the visualization pipeline
- Data acquisition and representation
- Basic visual mapping concepts (marks + channels)
- Human visual perception + Color
- Visual mappings for tables and multi/high-dimensional data
- Visual mappings for networks, graphs and trees
- Visual mappings and algorithms for 2D+3D scalar, vector, and tensor fields
- Principles of multiple coordinated views
- Visualization for big data and machine learning
- Principles of Evaluation of visual analysis systems

Grading:
Grading to be announced during the first week of classes.
Required Books:
Visualization Analysis and Design, Tamara Munzner, CRC Press, 2014, 9781466508910

Recommended Books:
Data Visualization: Principles and Practice, Alex Telea, CRC Press, 2014, 9781466585263

Academic Honesty Statement:
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).