CMPT 767 - G100 Visualization

Instructor(s): Steven Bergner

SFU Burnaby

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 ).