Information Visualization

Intro, Time Series Exercise

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http://www.cs.ubc.ca/~tmm/courses/547-19

Visualization (vis) defined & motivated
Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively.
Visualization is suitable when there is a need to augment human capabilities rather than replace people with computational decision-making methods.

• human in the loop needs the details
  – doesn’t know exactly what questions to ask in advance
  – long-term exploratory analysis
• speed up through human-in-the-loop visual data analysis
  – presentation of known results
  – stepping stone towards automation: refining, rebuilding
• intended task, measurable effectiveness

Class participation
• in-class group/individual exercises
• workshopping/critique for projects
• crucial part of attending, expected attendance
  – tell me in advance if you’ll miss class (and why)
  – tell me when you recover if you were ill
  – (written comments credit still possible if submitted in advance)

Audience
• no formal prerequisites
  – many areas helpful but not required
• human-computer interaction (HCI), eg CPSC 544 this term or equivalent
• computer graphics, computer science, machine learning, statistics, algorithms, “application domain”
  – programming skills required for most project types
• open to non-CS people
  – no programming background, see do analysis or survey project
  – communication skills important in English for success
• substantial reading, writing, discussion, presentations
• need strength in at least one of these: programming, English, HCI
  – unsuccessful combination: weak ESL, weak programming, no HCI background
• open to informal auditors
  – some or all days of readings/discussion/exercises, you’ll get out of it what you put into it...

Readings
• textbook
  – Tamara Munzner: Visualization Analysis and Design.AK Peters Visualization Series.
    – CR 547: 2014
    – library has multiple free ebook copies
  – no, buy from cheapest is amazon.com
  – hardcover banded with ebook
• papers
  – links posted on course page
  – if DL, links, use library EZproxy off campus
• readings posted by 6 days before class
• ~4 each session: mix of chapters & papers

Comments submission & marking
• written comments on reading in advance, in two rounds
  – round 1 due 10am (4 hrs before class), 90% of comment mark
  – for each reading
  – bring printout or laptop with you, springboard for discussion
  – post to Canvas discussion group
  – round 2 due 1:30pm (30 min before class), 10% of comment mark
  – written responses to at least 2 comments per session/week
  – you can only read comments from others after you post your own
  – start as pass/fail marking, see how it goes
  – switch to explicit marking if quality concerns

Projects [50%]
• groups of 2, 3, or 4
• amount of work commensurate with group size
• permission for solo project granted in exceptional circumstances, by petition
• milestones along the way, mix of written & in-class
  – new few years formative feedback only
  – pitches (drafts), proposals, peer project reviews
  – final versions
  – final presentations (oral) Tue Dec 10, afternoon
  – whole days invited, refreshments served
  – final reports (written) Fri Dec 13, 11:59pm
  – summative written feedback for both
• resources
  – more on datasets and tools later

Projects: Design studies
• BYOD (Bring Your Own Data)
  – you (or your teammates) have your own data to analyze
  – thesis/research topic
• personal interest
• dovetail with another course (sometimes works, but timing may be tricky)

Marking
• 55% Projects
  – 15% Interim Milestones (pass/fail)
  – extensive feedback along the way
  – good help, you make projects the best they can be!
  – 15% Final Presentation
• 25% Content
  – 50% Final Report
• 20% Participation
  – 20% Oral Group Participation
  – 25% Overview Participation
  – 25% Class Work/Assignments (pass/fail)
  – 15% Discussion

Logistics
Finding me
• email is the best way to reach me: tmm@cs.ubc.ca
• office hours Tue right after class (5-6pm)
  – or by appointment
  – unlikely to reach me by dropping by usually either in meeting or elsewhere
• X661 (Wing of ICICS/CS bldg)
• course page is font of all information
  – don’t forget to refresh, frequent updates
  – http://www.cs.ubc.ca/~tmm/courses/547-19

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Case C: ChronoLenses
https://youtu.be/k7pI8ikczqk]

Now: In-class design exercise, in small groups
• Five time-series scenarios
  – A: every 5 min, duration 1 year, 1 thing: building occupancy rates
  – B: every 5 min, 1 year, 2 things: currency values (exchange rate)
  – C: many years and many things: every 5 min, 5 years, 10 currencies
  – D: many things: every 5 min, 1 year, CPU load across 1000 machines
  – E: several parameters, many things: every 5 min, 1 year, 10 params on 1000 machines
• Small-group exercise: 15-20 min
  – one group per table (4 people/group)
• Reportback: 30-40 min
  – 3 min from each group
• Design space examples/discussion: 20-30 min
  – topics at http://www.cs.ubc.ca/~tmm/courses/infovis/presentations.html

Case A: 3D Approach (Not Recommended)
• extruded curves: detailed comparisons impossible
  – VAD book, Ch 1: What’s Vis, and Why Do It?
  – VAD book, Ch 2: What: Data Abstraction
  – VAD book, Ch 3: Why: Task Abstraction

Case A: Cluster-Calendar Solution
• derived data: cluster hierarchy
• juxtapose multiple views: calendar, superimposed 2D curves
  – VAD book, Ch 1: What’s Vis, and Why Do It?
  – VAD book, Ch 2: What: Data Abstraction
  – VAD book, Ch 3: Why: Task Abstraction

Case E: LiveRAC video

Next Time
• to read
  – VAD book, Ch 1: What’s Vis, and Why Do It!
  – VAD book, Ch 2: What: Data Abstraction
  – VAD book, Ch 3: Why: Task Abstraction
  – paper: Design Study Methodology

Break