Audience

- no prerequisites
  - many areas helpful but not required
- human-computer interaction, computer graphics, cognitive psychology, graphic design, algorithms, machine learning, statistics.
- open to non-CS people
  - if no programming background, can do analysis or survey project
- open to advanced undergrads
  - talk to me
- open to informal auditors
  - some or all days of readings/discussion, as you like
  - you’ll get out of it what you put into it...

Class time

- week 1
  - I lecture
- weeks 2-3, 5-10
  - before class: you read chapter+paper; write questions/comments
  - during class: we discuss
- week 4
  - guest lectures (Ben Shneiderman, Michelle Borkin, Matt Bremer)
- week 11
  - no class (annual VIS conference)
- weeks 12-13
  - before class: you each read paper on topic of your choice
  - during class: you present to everybody else (~10 min)

Marking

- 50% Project
  - 1% Papers
  - 10% Proposal
  - 4% Status Updates
  - 15% Final Presentation
  - 20% Final Report
  - 50% Content
  - 50% Presentations
  - 75% Content, Summary, 50% Analysis, 25%; Critique 25%
  - 25% Delivery: Presentation Style 50%, Slide Quality 50%
- 30% Participation
  - 60% Written Questions
  - 40% In-Class Discussion

Marking by buckets
- great 100%
- good 89%
- ok 78%
- poor 67%
- zero 0%

Presentations

- last two weeks of class
- present, analyze, and critique one paper
  - send me topic choices by Oct 24, I will assign papers accordingly
  - deep dive with another course (sometimes possible but timing can be difficult)
- project possibilities will be posted on resource page soon
  - http://www.cs.ubc.ca/~tmm/courses/547-14/resources.html

Projects

- BYOD (Bring Your Own Data)
  - you have your own data to analyze
  - your thesis/research topic (very common case)
  - dovetail with another course (sometimes possible but timing can be difficult)

Course Goals

- twofold goal
  - specific: teach you some infovis
  - generic: teach you how to be a better researcher
- feedback through detailed written comments on writing and presenting
  - both content and style
- at least of paper review for your final project
- goal: within a week or so
- fast marking for reading questions
  - great/ok/poor/zero
- goal: turn around before next class
  - *one week at most

Defining visualization (vis)

Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively.

Why...
Data/task abstraction
Visual encoding/interaction idiom
Algorithm
Domain situation

Why have a human in the loop?
Why use an external representation?
Why have a computer in the loop?
Why depend on vision?

Dataset Types
- Tables
- Networks
- Field (Continuous)
- Geometry (Spatial)

Attribute Types
- Categorical
- Ordered
- Inverted
- Quantitative

Four Levels of Design
- Domain situation
- Data/task attributes
- Visual encoding/interaction idiom
- Algorithm

Networks & Spatial Data
- Shapes
- Topology
- Paths

Analysis: What, why, and how
- what is shown?
- data abstraction
- why is the user looking at it?
- task abstraction
- how is it shown?
- idiom: visual encoding and interaction
- abstract vocabulary avoids domain-specific terms
- translation process is iterative, tricky
- what/why/how analysis framework as scaffold to think systematically about design space

Action: low-level query
- how much of the data matters?
- one, some, all

Why have a human in the loop?

Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively. However, computer-based visualization systems can only provide partial visual representation of datasets. Therefore, it is important to have a human in the loop to make better decision-making methods. It is also important to have a computer in the loop to make better decision-making methods. Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively. However, human visual system is high-bandwidth channel to brain. Therefore, human attention and memory is important. Resource limitations are also important. Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively. However, computer-based visualization systems can only provide partial visual representation of datasets. Therefore, it is important to have a human in the loop to make better decision-making methods. It is also important to have a computer in the loop to make better decision-making methods. Computer-based visualization systems provide visual representations of datasets designed to help people carry out tasks more effectively. However, human visual system is high-bandwidth channel to brain. Therefore, human attention and memory is important. Resource limitations are also important.

Idiom design space

The design space is determined by the data, and it includes the considerations of both how to create and how to interact with visual representations. The idiom is distinct from creating or manipulating visual representations. The idiom focuses on how to create visual encoding, how many possibilities there are, how to manipulate an interaction idiom, and even more possibilities. The idiom focuses on how to create visual encoding, how many possibilities there are, how to manipulate an interaction idiom, and even more possibilities.

Attribute Types

- Categorical
- Ordinal
- Quantitative

Dataset Availability

- Static
- Dynamic

Datasets

- Tables
- Attributes (columns)
- Items (rows)
- Cell containing value
- Grid of positions
- Geometry (Spatial)

Why not show the data in detail?

• summaries lose information
- confirm expected and find unexpected patterns
- assess expected and find unexpected patterns

Why have a computer in the loop?

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• combine information within single view
• elide
  – selectively filter and aggregate
• superimpose layer
  – local lens
• distortion design choices
  – region shape: radial, rectilinear, complex
  – how many regions: one, many
  – region extent: local, global
  – interaction metaphor