

InfoVis Group Research

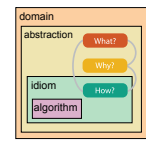
Tamara Munzner
 Department of Computer Science
 University of British Columbia
 @tamaramunzner
 CPSC 344 Outro
 20 Mar 2024
www.cs.ubc.ca/~tmm/talks.html#344-outro24mar

Visualization defined & motivated

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

Nested model: Four levels of visualization design

- domain situation
 - who are the target users?
- abstraction
 - translate from specifics of domain to vocabulary of vis
 - what is shown? **data** abstraction
 - why is the user looking at it? **task** abstraction
- idiom
 - how is it shown?
 - visual encoding** idiom: how to draw
 - interaction** idiom: how to manipulate
- algorithm
 - efficient computation



[A Nested Model of Visualization Design and Validation. Review. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]
 [A Multi-Level Typology of Abstract Visualization Tasks. Behavior and Information Science Proceedings. IEEE TVCG 19(1):219-228, 2013 (Proc. InfoVis 2013).]

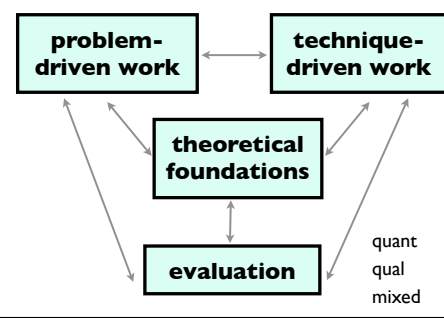
Why is validation difficult?

- different ways to get it wrong at each level
-
- [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

Evaluation: broadly interpreted

- methods from many fields, qualitative & quantitative
 - controlled experiments in lab, field studies of deployed systems
-
- [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

Tamara Munzner, UBC CS, InfoVis Research



Problem-driven work

- design studies
 - in collaboration with target users
 - real data, real tasks
 - intensive requirements analysis
 - iterative refinement
 - deploy tools/systems
 - typical evaluation: field studies
 - pre-design & post-deployment, often qualitative
 - opportunistic collaboration
 - many domains, industry & academia

Design studies: domains

- many domains
 - fisheries, in-car networks, journalism, ...
- genomics
 - Harvard Med School, BC Cancer, UBC Biodiversity, Agilent, ...
- log analysis
 - Google web search, AT&T web hosting, Mobify e-commerce
 - building & energy usage

Ocupado design study

Ocupado: Visualizing Location-Based Counts Over Time Across Buildings

Michael Oppermann
 Tamara Munzner

<https://youtu.be/KcwJK8eUdw>

Technique-driven work

- scalable algorithms & systems
 - typical evaluation: computational benchmarks
- new visual encoding & interaction techniques
 - typical evaluation: controlled experiments with people (quant)
 - typical evaluation: qualitative assessment
- areas
 - graph drawing, dimensionality reduction
 - human-in-the-loop curation/assessment of ML results

TimelineCurator

<https://youtu.be/Lf398EEswM>

Courses

- grad course CPSC 547: next offering Sep 2025
- ugrad course: CPSC 447, Information Visualization
 - (first three years was CPSC 436V)
 - last offering <https://www.students.cs.ubc.ca/~cs-447/23Sep/>
 - next one will be Jan 2025
 - 4th year majors course
 - theory: visualization foundations
 - tooling: D3.js
 - prereq: CPSC 310 (for JavaScript)
 - HCI not required, but very helpful

More info

- book (free through UBC library) <http://www.cs.ubc.ca/~tmm/vadbook>
 - papers, videos, software, talks, courses <http://www.cs.ubc.ca/group/infovis>
<http://www.cs.ubc.ca/~tmm>
-
- www.cs.ubc.ca/~tmm/talks.html#344-outro24mar @tamaramunzner