Problem-driven work

- "design studies"
  - in collaboration with target users
  - real data, real tasks
  - iterative refinement
  - deploy tools/systems
  - typical evaluation: field studies

- my strategy: opportunistic collaboration
  - many domains
  - both industrial and academic partners

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Papers Process & Pitfalls

Methodology for problem-driven work

- definitions
- 9-stage framework
- 32 pitfalls & how to avoid them
- comparison to related methodologies

Problem-driven: Tech industry

Segmentifier: Interactively Refining Clickstream Data into Actionable Segments

Methodology for problem-driven work

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Design study methodology: definitions

9-stage framework

• guidelines: confirm, refine, reject, propose

Design study methodology: 32 pitfalls
• and how to avoid them

Considerations

Design study methodology: 32 pitfalls
Referring to lessons learned from the specific situation of study to derive new or refined general conclusions. Similarly, reflecting on lessons learned from the first version of a system most often does not constitute a conclusive contribution. Conversely, reflecting on lessons learned across many projects [76], but in retrospect we have seen many examples of this pitfall as reviewers, and we confess with writing for qualitative research in the social sciences. In order of presentation and argumentation in a paper should follow a synthesis but has since become internalized and implicit. Moreover, the visualization researcher to explain hard-won knowledge about the domain from the set of events that constitute a design study. First, the researcher is central and desirable, rather than being a dismaying incursion of subjectivity that is a threat to validity; van Wijk makes the point with design study methodology. First is the idea of learning through observation and practice within the culture using methods that include observation judge design studies:

MINORITY FROM THESE METHODOLOGIES TO BUTTRESS A KEY CLAIM ON HOW TO TRANSFER ABILITIES FROM THE SET OF EVENTS THAT CONSTITUTE A DESIGN STUDY. FIRST, THE RESEARCHER IS CENTRAL AND DESIRABLE, RATHER THAN BEING A DISMAYING INCURSION OF SUBJECTIVITY THAT IS A THREAT TO VALIDITY; VAN Wijk MAKES THE POINT WITH DESIGN STUDY METHODOLOGY. FIRST IS THE IDEA OF LEARNING THROUGH OBSERVATION AND PRACTICE WITHIN THE CULTURE USING METHODS THAT INCLUDE OBSERVATION, JUDGE DESIGN STUDIES:

• and how to avoid them

9-stage framework

reflect write iterative

Example from the trenches: Don’t step on your own toes!

First design round published

Sedlmair et al., Information Visualization 10(3), 2011

Table 1. Summary of the 32 design study pitfalls that we identified.

<table>
<thead>
<tr>
<th>Pitfall</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF-1</td>
<td>Premature advance: jumping forward over stages</td>
</tr>
<tr>
<td>PF-2</td>
<td>Premature start: insufficient knowledge of vs literature</td>
</tr>
<tr>
<td>PF-3</td>
<td>Premature start: insufficient knowledge of vs literature</td>
</tr>
<tr>
<td>PF-4</td>
<td>Premature start: insufficient knowledge of vs literature</td>
</tr>
<tr>
<td>PF-5</td>
<td>Premature start: insufficient knowledge of vs literature</td>
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<td>PF-6</td>
<td>Premature start: insufficient knowledge of vs literature</td>
</tr>
<tr>
<td>PF-7</td>
<td>Premature start: insufficient knowledge of vs literature</td>
</tr>
</tbody>
</table>

9-stage framework

learn winnow cast

Matthew Brehmer
http://timelinecurator.org
The general case for curation
- build for human in the loop
  - automatic processing to accelerate results
  - assume computational results good but not perfect
  - for the indefinite future!
  - visual feedback to accelerate

Architecture

@tamaramunzner

Visualization Analysis and Design
- book page
  - https://www.elsevier.com/books/hv/798665017
  - https://www.elsevier.com/books/visual-data-analysis/9781462569121
  - free to read online within UBC
  - https://booksite.elsevier.com/9781462569121
- slide decks as many talk lengths (1, 2, 3, 6, 8+ hrs), some w/ videos

Teaching

Visualization Teaching at UBC: Me
- Computer Science grad
- newer all students are CS preps, non-programming project options available
  - teaching not taught (most use D3 or R)
- Computer Science undergrad
  - coming in January 2020, 4th year CS majors
  - teaching D3
- Data Science
  - teaching R
- Journalism
  - teaching Tableau
- Ed Psych, Forestry, Geography, School Psychology
Visualization Teaching Across UBC
• many other visualization-focused courses
  – Ed Psych
  – Forestry
  – Geography
  – iSchool
  – Psychology
• initial list compiled
  https://dfp.ubc.ca/initiatives/viz-ubc/visualization-courses
  – please contact vizatubc-info@cs.ubc.ca with additions/corrections!
• still todo: compile list of courses with significant visualization content

Engaging with visualization teaching
• teach/take a visualization-focused course
• teach/take domain-oriented course where visualization plays a role
  – presentation
  – exploratory data analysis
• offer your domain problem as project topic
  – research or administrative data

Engaging: Possible Next Steps

Pathways to participate
• participate in IEEE VIS 2019 in Vancouver, Oct 20-25
  – http://ieeevis.org
  – big 3 research tracks: VA, InfoVis, SciVis
  – many associated events
    • Vis in Data Science
    • Vis In Practice
    • Large Data Analysis & Visualization
    • Application Spotlights
    • many workshops including bio, security, ...
  – job fair (asynchronous)

Visual Design Process In Depth: Dear Data
• inspiring celebration of data humanism
  • Giorgia Lupi and Stefanie Posavec
  • http://www.dear-data.com/by-week/

Visual Design Process In Depth: Data Sketches
• detailed process notes, from sketching through coding
  • Shirley Wu and Nadieh Brehmer
  • http://www.datasketch.es/

More Information
• this talk
  https://www.cs.ubc.ca/~tmm/talks.html#vizatubc19-entry
• papers, videos, software, talks, courses
  http://www.cs.ubc.ca/group/infovis
  http://www.cs.ubc.ca/~tmm

Q&A References
• entry points for practitioners?
  – D3 resources for advanced programmers:
  – R resources for range of programming experience:
    https://www.tidyverse.org/
  – https://ggplot2.tidyverse.org/
  – Tableau resources, for non-programmers:
    https://www.tableau.com/
  – Andy Kirk’s continuously updated resources list
    http://www.visualisingdata.com/resources/
  • many of these do not require programming!

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Redesign En Masse: Makeover Mondays
• easy entry point, Tableau focus
  • http://www.makeovermonday.co.uk/blog/