DESIGN STUDY METHODOLOGY:
Reflections from the Trenches and the Stacks

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DESIGN STUDIES

Popular

SignalLens  BallotMaps  MulteeSum

ABySS-Explorer  code_swarm  Vismon
DESIGN STUDIES

Hard!
Design Studies

How to?

Methods

Methodology

http://www.air-n-water.com/blog/quick-summer-meal/
http://manwifeanddog.com/2012/05/05/a-homemade-recipe-for-a-happy-wife/
Design Studies

How to?

Good ingredients

Methods

Methodology

http://www.air-n-water.com/blog/quick-summer-meal/
http://manwifeanddog.com/2012/05/05/a-homemade-recipe-for-a-happy-wife/
DESIGN STUDIES
How to: Methods

DATA SKETCHES
[Lloyd and Dykes, InfoVis 2011]

MILCs
[Shneiderman and Plaisant, BELIV 2006]

INSIGHT-BASED
[Sarayia et al., TVCG 2005]
Design Studies

How to: Methodology

Good ingredients

Methods

... but no recipes

Methodology

http://www.air-n-water.com/blog/quick-summer-meal/
http://manwifeanddog.com/2012/05/05/a-homemade-recipe-for-a-happy-wife/
**Design Studies**

Three paragraphs!

visweek.org

Munzner 2008

**Application / Design Study papers** explore the choices made when applying visualization and visual analytics techniques in an application area, for example relating the visual encodings and interaction techniques to the requirements of the target task. Similarly, Application papers have been the norm when researchers describe the use of visualization techniques to glean insights from problems in engineering and science. Although a significant amount of application domain background information can be useful to provide a framing context in which to discuss the specifics of the target task, the primary focus of the case study must be the visualization content. The results of the Application / Design Study, including insights generated in the application domain, should be clearly conveyed. Describing new techniques and algorithms developed to solve the target problem will strengthen a design study paper, but the requirements for novelty are less stringent than in a Technique paper. Where necessary, the identification of the underlying parametric space and its efficient search must be aptly described. The work will be judged by the design lessons learned or insights gleaned, on which future contributors can build. We invite submissions on any application area.
GOAL

Design Study Methodology
Reflections ...

...from the trenches

+ reading/reviewing
Reflections ...  

...and the stacks
Contributions

Definitions

9-stage framework

32 pitfalls

Comparison to related methodologies
Contributions

Definitions

9-stage framework

32 pitfalls

Comparison to related methodologies

Wholesale adoption inappropriate
Definition

What is a Design Study?
Our Definition

Design Study

- a project
- a specific real-world problem
- design a visualization system
- validate the design
- reflect about lessons learned
Design Study
- a project
- a specific real-world problem
- design a visualization system
- validate the design
- reflect about lessons learned
real users and real data, collaboration is (often) fundamental

Design Study
- a project
- a specific real-world problem
- design a visualization system
- validate the design
- reflect about lessons learned
implications: requirements, multiple ideas

Design Study
- a project
- a specific real-world problem
- design a visualization system
- validate the design
- reflect about lessons learned
Design Study

- a project
- a specific real-world problem
- design a visualization system
- **validate** the design
- reflect about lessons learned
improve design guidelines
[see also Meyer, Sedlmair, and Munzner, BELIV 2012]

Design Study
- a project
- a specific real-world problem
- design a visualization system
- validate the design
- reflect about lessons learned
The 9-stage Framework
How to do a Design Study?
Selected Pitfalls

What to avoid?
PITFALL

PREMATURE COLLABORATION

PRECONDITION

CORE

ANALYSIS

learn → winnow → cast → discover → design → implement → deploy → reflect → write
I’m a domain expert! Wanna collaborate?

Of course!!!
Have data?
Have time?
Have need?

Interesting problem?

considerations
Are you a user???

... or maybe a fellow tool builder?

COLLABORATOR

MR. VIS
EXAMPLE FROM THE TRENCHES
Premature Collaboration!

PowerSet Viewer
2 years / 4 researchers

WikeVis
0.5 years / 2 researchers
**Example From The Trenches**

Premature Collaboration!

- **PowerSet Viewer**
  2 years / 4 researchers

- **WikeVis**
  0.5 years / 2 researchers

- Fellow tool builders
- Data promised
Metaphor
Winnowing
Collaborator Winnowing

initial conversation

(potential collaborators)
COLLABORATOR WINNOWING

initial conversation

further meetings
COLLABORATOR WINNOWING

initial conversation

further meetings

prototyping
Collaborator Winnowing

- initial conversation
- further meetings
- prototyping
- full collaboration
COLLABORATOR WINNOWING

Talk with many, stay with few!
PITFALL

PREMATURE DESIGN COMMITMENT

PRECONDITION       CORE       ANALYSIS
Of course they need the cool **technique** I built last year!
METAPHOR

Design Space

+ good
○ okay
- poor
METAPHOR

Design Space

your technique...
METAPHOR

Design Space

know
METAPHOR

Design Space

know

consider
METAPHOR

Design Space

know
consider
propose
METAPHOR

Design Space

know
consider
propose
select
Think broad!
I can write a design study paper in a week!

“writing is research”

[Wolcott: Writing up qualitative research, 2009]
METAPHOR

Horse Race vs. Music Debut

Must be first!

Am I ready?

technique-driven

problem-driven


http://www.alaineknipes.com/interests/violin_concert.jpg
EXAMPLE FROM THE TRENCHES
Don’t step on your own toes!

First design round published

Subsequent work not stand-alone paper

AutobahnVis 1.0
[Sedlmair et al., Smart Graphics, 2009]

AutobahnVis 2.0
[Sedlmair et al., Information Visualization 10(3), 2011]
Summary
SUMMARY

- why design study methodology
- definition
- 9-stage framework
- selected pitfalls
  - premature collaboration
  - premature design commitment
  - premature publishing
FUTURE WORK
A Start, not an End!

Not the only way!

PRECONDITION

CORE

ANALYSIS

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Thank you!

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http://www.cs.ubc.ca/labs/imager/tr/2012/dsm/
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