Problem-Driven Vis Research

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soon to be:
University of Utah
visualization
technique-driven BioMesh3D

M. Meyer et al., SMI 2005.
M. Meyer et al., Vis 2007.
M. Meyer et al., Vis 2008.
M. Meyer et al., TVCG 2006.
exploratory, complex data analysis tasks by domain experts: biologists
CONTRIBUTIONS

**micro**
data validation

**macro**
computation refinement

confirm previously known results faster

new hypotheses and follow-up experiments
CONTRIBUTIONS

**micro**

new visual encodings

**macro**

design patterns

integrating heterogeneous data is a bottleneck

methods and methodology
design study methodology

joint work with:
Michael Sedlmair and Tamara Munzner
DESIGN STUDY

a user-validated design
for an existing and reoccurring problem
with reflection
Collaboration is key...

**DATA LOCATION**

- Head
- Computer

**TASK CLARITY**

- Fuzzy
- Crisp
target → translate → design → evaluate → implement → validate

user-centered design
usability engineering
participatory design

PROBLEM-DRIVEN PROCESS MODEL

PROBLEM-DRIVEN PROCESS MODEL

target

translate

design

implement

validate

user-centered design
usability engineering
participatory design

PROBLEM-DRIVEN PROCESS MODEL

validate

PROBLEM-DRIVEN PROCESS MODEL

CONTRIBUTIONS

target : problem characterization
translate : task & data abstraction
design : encodings and interactions
implement : algorithms
validate

PROBLEM-DRIVEN PROCESS MODEL
IMPLICATION
beyond pretty pictures . . .
. . . deep investigation into task-oriented data analysis
CHALLENGES

- train students
- establish and maintain fruitful collaborations
- build upon problem-driven work
- define the broader impacts on computer science