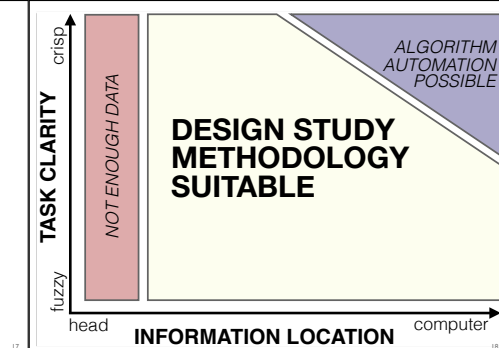
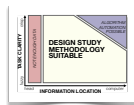


How To Do Design Studies

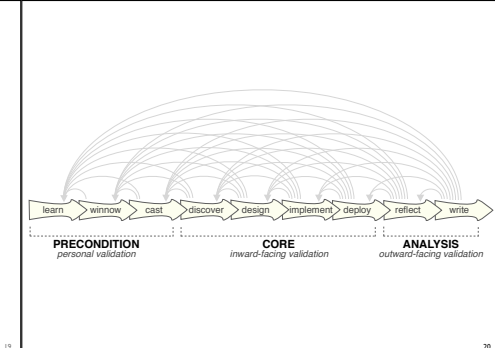
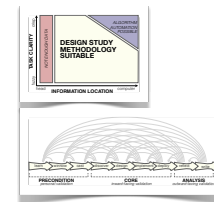
- definitions



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How To Do Design Studies

- definitions
- 9-stage framework

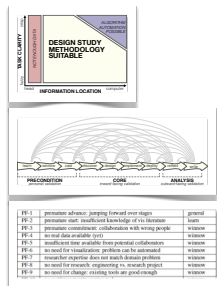


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How To Do Design Studies

- definitions
- 9-stage framework
- 32 pitfalls and how to avoid them



Pitfall Example: Premature Publishing

technique-driven

problem-driven

Must be first!

Am I ready?



<http://www.foxsports.com/story/2012/02/27/early-publishing-loses-control-the-competition>

<http://www.bbc.com/news/health-2012-02-27>

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Where To Start: Many Flavors of Work

- **Problem-driven work**
 - design studies
- **Technique-driven work**
 - algorithms, idioms
- **Evaluation**
 - lab/field/data studies
- **Theoretical foundations**
 - models

Design Studies: Biology Domain

- Variant View: gene sequence variants
- MulteeSum, Pathline: comparative functional genomics
- MizBee: comparative genomics (synteny)
- Cerebral: gene expression + interaction network



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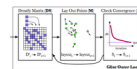
Design Studies: Other Domains

- RelEx: automotive networks
- Vismon: fisheries simulation/mgmt
- LiveRAC: large-scale system monitoring
- SessionViewer: web logs



Techniques/Systems: Dimensionality Reduction

- Glint: costly distance functions
- DimStiller: visual dimensional analysis and reduction toolkit
- Glimmer: GPU accelerated MDS

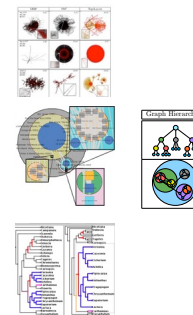


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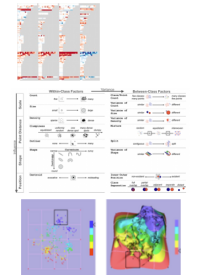
Techniques: Graphs/Trees

- general multilevel/compound graphs
 - layout
 - TopoLayout
 - interaction
 - Grouse
 - GrouseFlocks
 - TugGraph
- evolutionary tree comparison
 - TreeJuxtaposer



Evaluation: Dimensionality Reduction

- guidance on scatterplot/DR choices
- taxonomy of cluster separation factors
- 2D points vs 3D landscapes

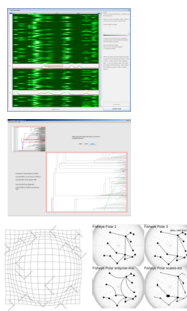


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Evaluation: Focus+Context

- overviews: separate vs. integrated views
- navigation: stretch and squish vs. pan/zoom navigation
- impact of distortion on visual search, visual memory



Evaluation, When and How (excerpt)

Tamara Munzner
University of British Columbia

Evaluation: How Much Evaluation Is Enough?
Panel VIS13

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Victories and challenges: I

- evolving sophistication: the user study pendulum swings
- we've come a long way!
- no user studies at all
- a few dubious ones, lacking rigor
- some good ones appear
- rigorous studies are common
- but pushes to change culture often overshoot...
 - some reviewers expect all papers to have user studies
 - some authors do user studies without understanding why or how



<http://www.biolig.com/resources/pendulum.jpg>

Victories and challenges: II

- significance testing with controlled experiments
 - we've moved beyond "my friends liked it"
 - new frontier: multiple regression for comparison
 - [Cognitive measurements of graph aesthetics. Ware, Purchase, Colpays, and McGill. Information Visualization, 2002. 1(2): p. 103-110.]
 - new frontier: thinking beyond time and error
 - qualitative vs quantitative
 - different axis from lab/field
- BELIV workshops
 - 06 AVI, 08 CHI, 10 CHI, 12 VisWeek



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Victories and challenges: III

- post-deployment studies with target users
 - we've moved beyond "I'm the only one who's used it"
 - new frontier: post-adoption studies
 - Seven Scenarios: only 5 out of 800!

[Empirical Studies in Information Visualization: Seven Scenarios. Lam, Bertini, Isenberg, Plaisant, and Carpendale. TVCG 18(9):1520-1536, 2012.]

- what happens after you get that first paper out?...

Of course...

- ... you should evaluate your work
 - use appropriate methods!
- ... you should **not** have a user study in every paper
 - avoid litmus test and cargo cult thinking



http://en.wikipedia.org/wiki/Litmus_paper [PC]



<http://blog.thargames.com/wp-content/uploads/2012/05/cargo-cult.jpg>