

Visualization Analysis & Design

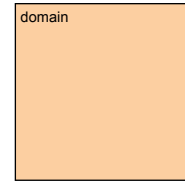
Analysis: Nested Model (Ch 4)



Tamara Munzner
 Department of Computer Science
 University of British Columbia
 @tamaramunzner

Analysis framework: Four levels, three questions

- domain situation
 - who are the target users?

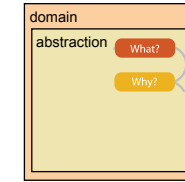


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

2

Analysis framework: Four levels, three questions

- 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

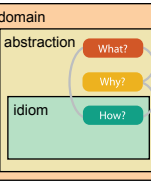


[A Multi-Level Typology of Abstract Visualization Tasks. Brehmer and Munzner. IEEE TVCG 19(12):2376-2385, 2013 (Proc. InfoVis 2013).]
 [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

3

Analysis framework: Four levels, three questions

- 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

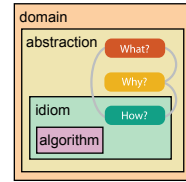


[A Multi-Level Typology of Abstract Visualization Tasks. Brehmer and Munzner. IEEE TVCG 19(12):2376-2385, 2013 (Proc. InfoVis 2013).]
 [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

4

Analysis framework: Four levels, three questions

- 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

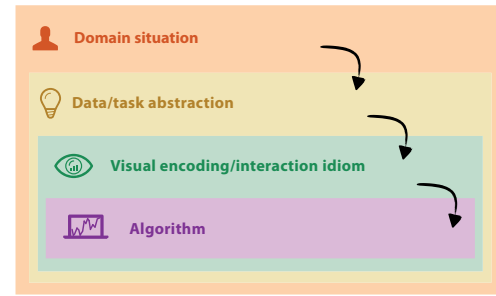


[A Multi-Level Typology of Abstract Visualization Tasks. Brehmer and Munzner. IEEE TVCG 19(12):2376-2385, 2013 (Proc. InfoVis 2013).]
 [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

5

Nested model

- downstream: cascading effects

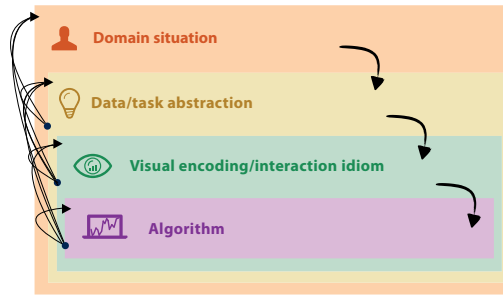


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

6

Nested model

- downstream: cascading effects
- upstream: iterative refinement

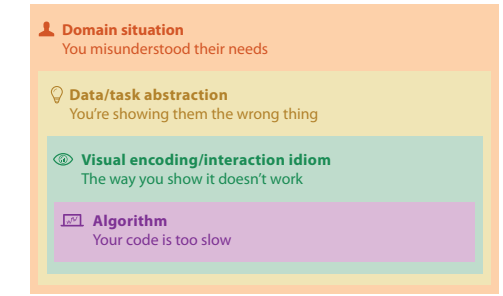


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

7

Why is validation difficult?

- different ways to get it wrong at each level

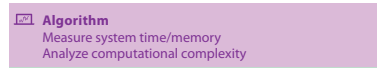


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

8

Why is validation difficult?

- solution: use methods from different fields at each level

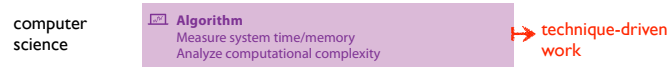


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

9

Why is validation difficult?

- solution: use methods from different fields at each level

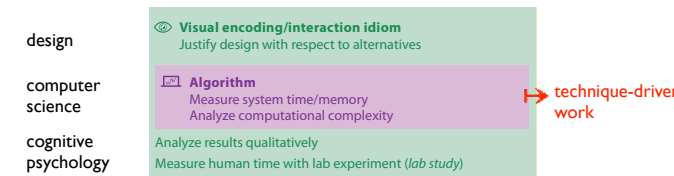


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

10

Why is validation difficult?

- solution: use methods from different fields at each level

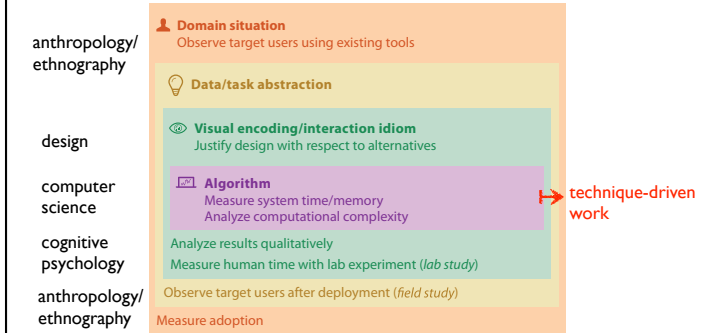


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

11

Why is validation difficult?

- solution: use methods from different fields at each level

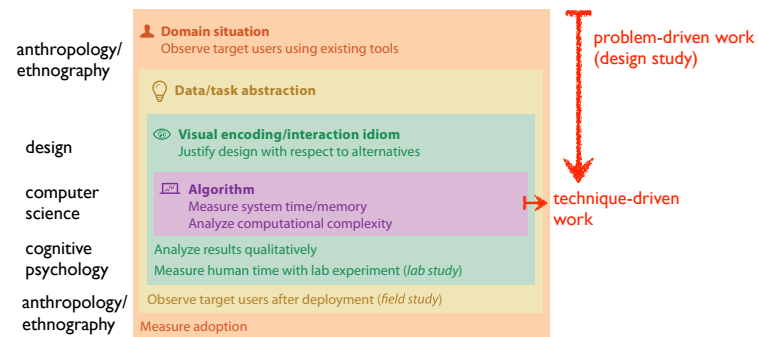


[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

12

Why is validation difficult?

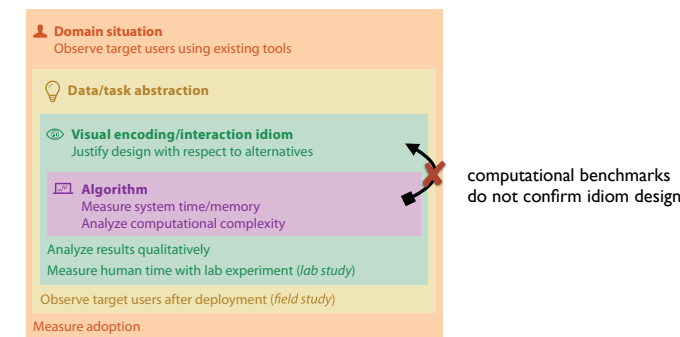
- solution: use methods from different fields at each level



[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

13

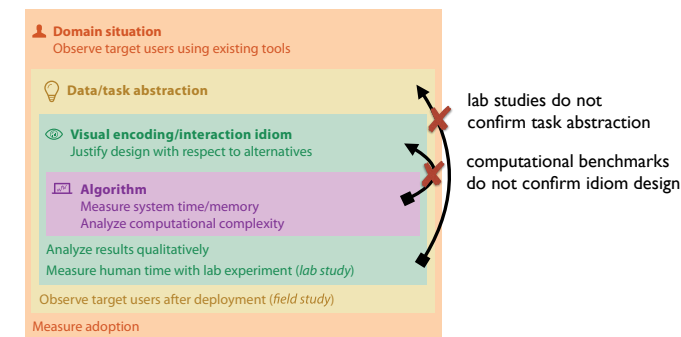
Avoid mismatches



[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

14

Avoid mismatches



[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]

15

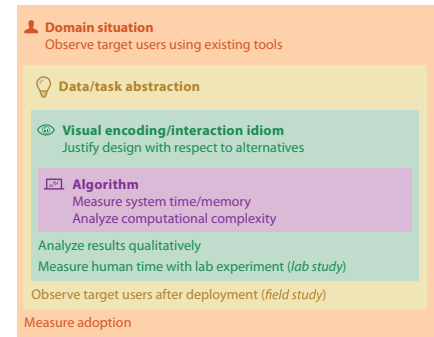
Visualization Analysis & Design

Analysis: Nested Model (Ch 4) II

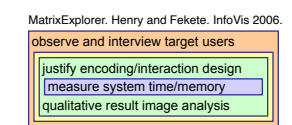
Tamara Munzner
 Department of Computer Science
 University of British Columbia
 @tamaramunzner



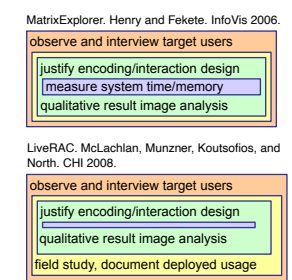
Analysis examples: Single paper includes only subset of methods



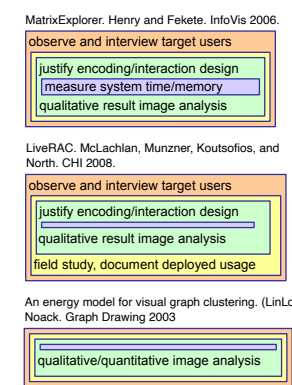
Analysis examples: Single paper includes only subset of methods



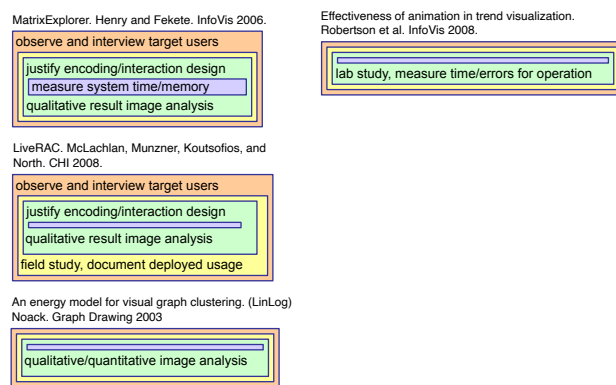
Analysis examples: Single paper includes only subset of methods



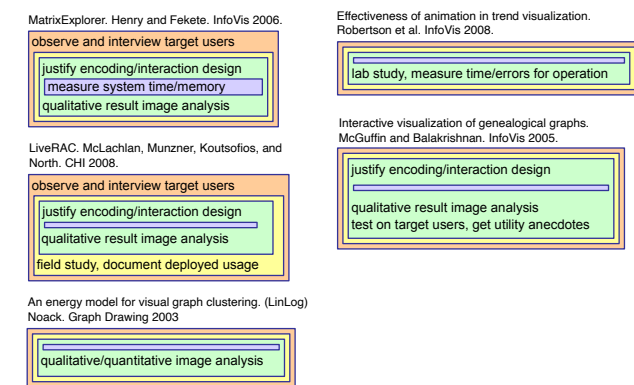
Analysis examples: Single paper includes only subset of methods



Analysis examples: Single paper includes only subset of methods



Analysis examples: Single paper includes only subset of methods



Analysis examples: Single paper includes only subset of methods

