Visualization Analysis & Design Analysis: Nested Model (Ch 4) Tamara Munzner Department of Computer Science	Analysis framework: Four levels, three questions domain situation who are the target users? 	 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
University of British Columbia @tamaramunzner	[A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928,2009 (Proc. InfoVis 2009).] 2	[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).]
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 idiam how is it shown? visual encoding idiom: how to draw interaction idiom: how to manipulate algorithm efficient computation Musti-Level Typology of Abstract Vaudication Design and Validation. Mummer: IEEE TVCG 19(12):2374-2385, 2013 (Proc. InfoVis 2013).] Why is validation difficult? solution: use methods from different fields at each level 	Nested model • downstream: cascading effects Image: provide the provided of	Nested model • downstream: cascading effects • upstream: iterative refinement Image: Comparison of the provided of the pr
[Algorithm Measure system time/memory Analyze computational complexity [A Nested Model of Visualization Design and Validation, Munzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]	Computer science Masure system time/memory Analyze computational complexity technique-driven work	design Image: State
Why is validation difficult?	Avoid mismatches	Avoid mismatches
 solution: use methods from different fields at each level anthropology ethnography Computer science cognitive psychology anthropology/ ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science cognitive psychology ethnography Computer science computer science Computer science Computer	Comparing transmission Deserve target users using existing tools O Data/task abstraction Visual encoding/interaction idiom Justify design with respect to alternatives Justify design with respect to alternatives Algorithm Measure system time/memory Analyze computational complexity Analyze results qualitatively Measure human time with lab experiment (<i>lab study</i>) Observe target users after deployment (<i>field study</i>) Measure adoption [A Nested Model of Visualization Design and Validation. Murzner. IEEE TVCG 15(6):921-928, 2009 (Proc. InfoVis 2009).]	A Domain situation Observe target users using existing tools Observe target users using existing tools Observe target users using existing tools Observe target users using existing tools Algorithm Measure system time/memory Analyze results qualitatively Measure human time with lab experiment (<i>lab study</i>) Observe target users after deployment (<i>field study</i>) Measure adoption [A Nested Model of Visualization Design and Validation. Munzner. IEEE TVCG 15(6):921-928. 2009 (Proc. InfeVis 2009).]



