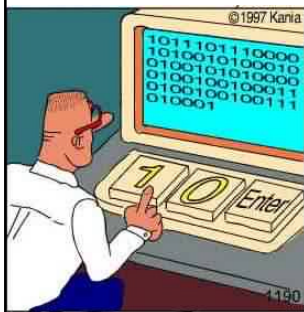


Software Visualization



Lecture WS 02/03

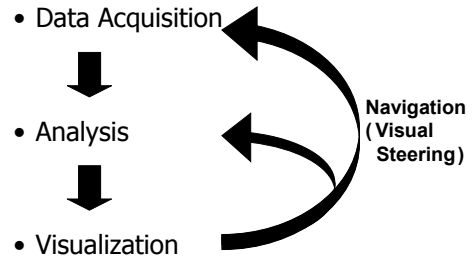
Visualization Pipeline
revisited

Real programmers code in binary.

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Visualization Pipeline



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Application domains and the visualization pipeline

	Data Acquisition	Analysis	Visualization
Algorithm Animation			
Program Analysis			
(Visual) Debugging			
Software Architecture			
Software Evolution			
■ ■ ■			

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Algorithm Animation

Data Acquisition	Analysis	Visualization
Interesting events Traces Direct access to program state	Filtering (events)	Primitive graphical objects (boxes, lines, circles, ...) Smooth animation Graphs 3D

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Program Analysis

Data Acquisition	Analysis	Visualization
Program text (Source code)	Lexical and syntactical analysis Control-Flow Analysis Data-Flow Analysis (inheritance, call graph)	Annotated graphs Critical paths

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(Visual Debugging)

Data Acquisition	Analysis	Visualization
Source code Machine code Input data Direct access to memory (registers, stack, heap)	Breakpoints Interactive inspection (unfolding) Reference pattern extraction Memory graphs (maximal common subgraph) Execution slices (Tarantula)	Various graphs of memory structure Program Text Color coding

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Software Architecture		
Design		
Data Acquisition	Analysis	Visualization
Requirements	Requirement analysis	Architecture diagram
Reengineering		
Data Acquisition	Analysis	Visualization
Source Documentation	Program analysis Inheritance graphs Manual code inspection	Architecture diagram Hierarchies Graphs
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Software Evolution		
Data Acquisition	Analysis	Visualization
Software archives Program code Bug database	Program analysis Statistic analysis	Color coded program code Animation Time as an axis in 2 or 3 dimensional diagrams Color coded graphs (GEVOL)
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Visualization and Analysis
<ul style="list-style-type: none"> •Graph drawing <ul style="list-style-type: none"> •Clustering •Mental map (incremental, animation) •Aesthetics •Scaling •Color coding
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