Reminder

- After each technology discussion, everyone should send constructive comments to the presenter, cc to me
- No one did this for the first one
- This is the second one
- Please get caught up before the end of this week

Compose Small Results into Big Results

17-839A

Mary Shaw
October MMI

http://spoke.compose.cs.cmu.edu/nr01/

Pro-forma abstract for whole paper

- The effectiveness of restructuring software in improving the design of software (and reducing its maintenance cost) has been demonstrated. An enhanced tool/method is described for meaning-preserving program restructuring based on star diagrams. This transformation support is costly, and the transformations are hard to understand. The tool provides visual and organizational aids. Examples, measurements, and a user study are provided confirming the effectiveness of its support for planning restructuring in design.
- Question: Method/means -- What is a better way to restructure programs, and can we automate it?
- Result: Technique -- Star diagram for visualization
- Tool --
- Validation: Analysis -- measurement of elision and user study

The argument of the paper

- Maintenance is expensive, better structure helps, but tools are imprecise and don’t scale
- Use star diagrams to record plans and hide details
- Star diagrams
  - Meaning-preserving restructuring transformations
  - Evaluation against criteria, quantitative scalability study, qualitative comparison of usage
- Iteration on tool
  - Improvements to scalability
  - Planning scenario (example)
  - Programmer and scalability studies
- Design improvements
- User interface improvements
The Cast at UCSD

- William Griswold, UCSD faculty [ref 7-9, 22, 24]
  > Tool for planning the restructuring of data abstractions in large systems
- Morison Chen, MS 1996 [ref 16, 24]
  > Supporting the restructuring of data abstractions through manipulation of a program visualization
- Robert Bowdidge, PhD 1995 [ref 7-10, 24]
  > Jenny Cabaniss, MS 1997 [ref 14]
  > Lessons learned from applying HCI techniques to the redesign of a user interface
- Van Nguyen, MS 1997 [ref 33]
  > Impact of adding customizability on software architecture: a case study
- David Morgenthaler, PhD 1997 [ref 24, 31]

Credibility Through Cumulating Evidence

- Several free-standing pieces of work come together to reinforce each other
- Paper reports two full iterations, plus a user study
- Examples build on each other, and the design-test-iterate cycle shows
- Validation includes scenarios, quantitative scalability studies, user studies
- Several individual papers’ worth of results are visible

Phase Times and Publications

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Typical publication venues

- Research workshops
- Conferences
- Archival journals
- Reviews
- Development workshops
- Popular journals
- Trade publications

Preview

- I’m giving a talk in the extended IC on Friday
- It will be an update of my ICSE talk, incorporating some of the material from last Thursday’s SSSG