Research Perspective on Supporting Software Engineering via Physical 3D Models

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Traditional engineering disciplines build solid, physical 3D models of their designs

Better presentation, comprehension, and communication among stakeholders, particularly in teamwork
Introduction

- Traditional engineering disciplines build solid, physical 3D models of their designs
- Better presentation, comprehension, and communication among stakeholders, particularly in teamwork

→ New research perspective to transfer these advantages to software engineering by physical 3D city models
ExplorViz in a Nutshell

Introduction
Potential Research Questions:

1. In **which scenarios/tasks** do physical models provide benefits?
2. How large is the **impact of gesticulation** on correctness and time spent in team-based program comprehension tasks?
Results

Program Comprehension Evaluation

- Overall results not significant
- 2 tasks influenced positively (*discussion tasks*)
- 1 task influenced negatively (*most occurring package name*)
Envisioned Usage Scenarios

- 2. Educational Visualization
- 3. Effort Visualization in Customer Dialog
- 4. Saving Digital Heritage
Limited Build Volume and Monochromacity

Encountered Challenges

[Image of a 3D printer]

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Physical 3D Models
Encountered Challenges
Related Work

- Physical models in Information Visualization
  http://dataphys.org/list
- Software city metaphor [WL07]
- Virtual reality [MLMD01, SSMM12] (see next presentation)
Summary and Outlook

Conclusions

- Physical 3D city models for supporting software engineering
- Open source\(^1\) and replication package\(^2\) provided

Explor\(\text{\scriptsize{orViz}}\)

Future Work:

- Larger team size in controlled experiment
- Evaluate the three other scenarios
- Other 3D visualization metaphors

\(^1\)http://www.explorviz.net
\(^2\)http://dx.doi.org/10.5281/zenodo.18378
Jonathan I. Maletic, Jason Leigh, Andrian Marcus, and Greg Dunlap. Visualizing object-oriented software in virtual reality. In Proc. of 9th Int. Workshop on Prog. Comprehension (IWPC 2001), pages 26–35. Society Press, 2001.

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