Live Trace Visualization for Comprehending Large Software Landscapes: The ExplorViz Approach

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ExplorViz
In many enterprise architectures the number of systems is constantly increasing.

Knowledge of the communication, internal behavior, and utilization of these software landscapes often gets lost.

Tools supporting the landscape and system comprehension for, e.g., component integration become important.
Interactive approach for the live, explorable visualization of software landscapes and their dynamic behavior

Combination of landscape and system level perspective

Our landscape level visualization bases on UML elements

System level visualization utilizing the city metaphor for each software system
Figure 1: Activities in our ExplorViz approach for live trace visualization of large software landscapes
Figure 2: Macro view on landscape level showing the communication between applications in the PubFlow (http://pubflow.de) software landscape.
System Level Perspective

ExplorViz

(a) Macro view visualizing four components of jPetStore

(b) Relationship view with opened service component

Figure 3: Mockup of system level perspective on the example of jPetStore for demonstrating the exploration concept
Related Work

- 2D visualization of program traces
  - Web Services Navigator [DPLP05], Jive and Jove [RT12], ExtraViz [CHZ07], sequence visualization [TTD12]

- 3D visualization of program traces
  - hemispheres based [BD04], static and dynamic properties in single view [BD06], TraceCrawler [GLW06], hierarchical edge bundling in city metaphor [CZB11], EvoSpaces [AD07]
Open Research Questions and Conclusions

Conclusions

Open Research Questions:

- Which stable layout is suitable for our 3D visualization?
- Does the communication direction have to be directly perceivable?
- Which clustering methods to provide a synthetic hierarchy?
- Which baseline, when evaluating in a controlled experiment?

Conclusions:

- ExplorViz: A web-based visualization approach which supports in the comprehension process of large software landscapes

1 http://www.explorviz.net, ffi@informatik.uni-kiel.de

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The ExplorViz Approach

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▶ Which stable layout is suitable for our 3D visualization?
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Conclusions:

▶ ExplorViz\(^1\): A web-based visualization approach which supports in the comprehension process of large software landscapes
▶ Combining the landscape and system level perspective

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Sazzadul Alam and Philippe Dugerdil.  
Evospaces: 3D visualization of software architecture.  

Michael Balzer and Oliver Deussen.  
Hierarchy based 3D visualization of large software structures.  

Johannes Bohnet and Jürgen Döllner.  
Visual exploration of function call graphs for feature location in complex software systems.  

Bas Cornelissen, Danny Holten, Andy Zaidman, Leon Moonen, Jarke J. van Wijk, and Arie van Deursen.  
Understanding execution traces using massive sequence and circular bundle views.  

Pierre Caserta, Olivier Zendra, and Damien Bodenes.  
3D hierarchical edge bundles to visualize relations in a software city metaphor.  

W. De Pauw, M. Lei, E. Pring, L. Villard, M. Arnold, and J. F. Morar.  
Web services navigator: Visualizing the execution of web services.  
