Summary 1:

VR City: Software Analysis in Virtual Reality Environment

Analysis and comprehension of code structure is critical to software maintenance and development. To reduce the time and cost of these processes, a more efficient and intuitive view of the code is necessary. VR city explores software visualization of object-oriented code in a VR environment and intuitive ways of understanding it through navigating that environment. The layouting algorithm derives the city layout from undirected graph that reflects coupling in a project. Classes are represented as cities and methods are represented as floors. Different building shapes are used to represent different type of class such as interfaces, abstract classes and ordinary classes. Different layers allow navigation from different aspects such as connection layer (code relation), author layer, and code layer (see source code by clicking on object). The city visualizes static (metrics and coupling), dynamic (runtime trace), and evolutional aspects (developer contributions to code over revisions) of the source code. Both dynamic and evolutional aspects are displayed with the aid of animation to demonstrate change over time. User can stop the animation to explore a particular point in time in VR in static view.

BibTeX:

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author={J. Vincur and P. Navrat and I. Polasek},
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abstract={This paper presents software visualization tool that utilizes the modified
city metaphor to represent software system and related analysis data in virtual
reality environment. To better address all three kinds of software aspects we
propose a new layouting algorithm that provides a higher level of detail and
position the buildings according to the coupling between classes that they
represent. Resulting layout allows us to visualize software metrics and source code
modifications at the granularity of methods, visualize method invocations involved
in program execution and to support the remodularization analysis. To further
reduce the cognitive load and increase efficiency of 3D visualization we allow users
to observe and interact with our city in immersive virtual reality environment that
also provides a source code browsing feature. We demonstrate the use of our
approach on two open-source systems.},
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metaphor;new layouting algorithm;program execution;software analysis;software
aspects;software metrics;software system;software visualization tool;source code
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