

Rule based graph visualization for software systems

Máté Cserép^a, Tibor Brunner^b

^aEötvös Loránd University, Hungary
mcserep@caesar.elte.hu

^bEricsson, Hungary
bruntib@caesar.elte.hu

Abstract

Supporting the comprehension of complex, industrial-size software systems became an important task of the software industry. Many of the comprehension tools are based on static source code analysis. As direct text-based analysis of the source code usually cannot be performed efficiently, hence such tools use a higher level representation of the source code, i.e. the abstract syntax tree. Having constructed from the source, the abstract syntax tree serves as the base of presenting the system to the user either in textual or graphical way. Graphical visualizations in different views and projections produce efficient assistance in the process of comprehension. A part of these visualization methods are to represent the structure of the source code with graphs revealing various aspects of the program.

Most static source code analysis tools support only pre-defined programming languages and diagram types, restricting the users from a more general use. Our solution presents an abstract, language-independent, rule-driven method that conduces to the creation of arbitrary, user defined graph visualizations from the abstract syntax tree. Our approach lets the user to describe the desired graph to visualize in a declarative way by defining a set of rules. A graph building algorithm then receives the abstract syntax tree as an input and generates the aforementioned visualization alongside of these rules.

Keywords: code comprehension, static analysis, abstract syntax tree, source code visualization, graph representation, graph building algorithm