



Bachelor's Thesis
**Universal Augmentation of Source Code with
Dynamic Analysis Data**

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Dynamic analysis tools, such as profilers or anomaly detectors, collect data during the execution of an application. This data is often summarized in text form or visualized with another stand-alone tool. A developer must then manually locate corresponding parts of the source code to understand the code that leads to the observed behavior and to make optimizations.

To enable a more efficient workflow, some analysis tools integrate with an IDE through plug-ins. This integration allows the developer to view analysis results directly in the IDE and to navigate to relevant source code files. Furthermore, the plug-ins can highlight important locations in the source code and can display detail information in tool-tip windows. However, the plug-ins must be implemented for each IDE individually, and to remain useful, they must be maintained for each supported IDE version and adapted to new IDE versions.

The task of this thesis is to come up with an approach to augment Java source code independent of the nature of the data and of the used IDE. First, this requires defining a generic file format which can be used to describe which syntax elements should be augmented in which fashion. An example would be to highlight each call to *Object.hashCode()* in method *foo.bar()* in red and display "Call to *Integer.hashCode()*" in a tooltip. Files in that format could then be generated by an analysis tool. Second, plug-ins for either NetBeans or the Eclipse IDE should be implemented which can load these files and display the described augmentations in the source code. In a third step, the file format and plug-ins could be extended with limited scriptability in JavaScript or Groovy to enable simple computations and a limited degree of interactivity.

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