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Bachelor's Thesis

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Integrating Feature-based Monitoring into AntTracks to Evaluate a New Architecture

Tracking memory usage is difficult because the purpose of an object, i.e., who created it and why, cannot be determined easily. However, objects are usually created within the context of a feature, whereas a feature is a piece of source code, i.e, a class, method, a single line, or a combination of those, implementing a specific application characteristic. To help developers find memory-related performance problems, the AntTracks VM is able to track memory, i.e., object allocations, object deallocations, as well as object movements.

The goal of this thesis is to extend the AntTracks analysis tool to track and visualize objects per feature. The user will provide a Feature-to-Code mapping, containing a description what code is associated with which feature at class, method, line, or bytecode level. Every piece of code can either be assigned to a single feature, no feature at all, or multiple features at once. Furthermore, a new web-based architecture for the analysis tool must be devised to enable experiments for a new version of the analysis tool.

This work is in part a reimplementation of a prototype published in Lengauer et al. [1] and is to be integrated into the superior AntTracks VM, published in Lengauer et al. [2] and Bitto et al. [3].

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[1] *Where Has All My Memory Gone? Determining Memory Characteristics of Product Variants using Virtual-Machine-Level Monitoring* (http://dx.doi.org/10.1145/2556624.2556628)
[2] *Accurate and Efficient Object Tracing for Java Applications* (http://dx.doi.org/10.1145/2668930.2688037)
[3] *Efficient Rebuilding of Large Java Heaps from Event Traces* (http://dx.doi.org/10.1145/2807426.2807433)