

## Semester Project

# Integrating Simplify into Jive

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In cooperation with University of Kaiserslautern, the Software Component Technology Group works on the Java Interactive Verification Environment, *Jive*. *Jive* allows one to interactively prove that JML annotated Java programs fulfill their specifications.

Currently, the interactive theorem prover *Isabelle* is used for specification and verification of general properties that are not directly related to the program to be verified. To this end, properties of the programming language (program independent) and some of the program's declaration information (program dependent) are formalized as Isabelle theories.

This approach has the disadvantage of Isabelle being difficult to work with for non-experts and users lacking background information about the underlying theories. For instance, a user has to know the name of a lemma in order to use it in a proof.

The goal of this project is to integrate the automatic theorem prover *Simplify* into *Jive*, ultimately aiming at bringing *Jive* to a higher level of automation. The idea is to have part of the verification conditions proved automatically by *Simplify* before exporting them to Isabelle.

The main tasks are:

- (i) Rewrite the program independent theories in the Simplify input language
- (ii) Implement a module that generates the program dependent theories in the Simplify input language
- (iii) Implement a module that generates the verification conditions in the Simplify input language
- (iv) Integrate the Simplify component into the Jive verification workflow (including GUI modifications)

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