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A DSL for Specializing AST Interpreters

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Truffle is a novel modeling language for implementing managed languages in Java. The language implementer writes an abstract syntax tree (AST) interpreter, which is integrated into the Truffle framework. The language developer has to adhere to a specific structure to create efficient interpreters, which sometimes is a repetitive and error-prone task.

The goal of this thesis is to simplify the development of specializing AST interpreters using a domain specific language. The DSL should be usable as an integral part of the Truffle framework. It should also integrate with the existing build and IDE infrastructure.

Specific sub-goals are:

- Identify specialization patterns in existing AST interpreters and simplify them using the DSL.

- Implement a language compiler for the DSL.

- The output of the DSL compiler should be embeddable within AST interpreters written in Java.

- Apply the DSL to at least one existing specializing AST interpreter.

- Apply object-oriented design techniques when implementing the language compiler.

Explicit non-goals are:

- Support the declaration of a full interpreter using the DSL.

The work's progress should be discussed with the supervisor at least every 2 weeks. Please note the guidelines of the Institute for System Software when preparing the written thesis.

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