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Master's Thesis

Low-Overhead Debugging Support for an LLVM IR Interpreter

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Sulong [1] is an effort to use the Truffle language implementation framework [2, 3] and the Graal dynamic compiler to implemement LLVM IR on top of a Java Virtual Machine.

LLVM IR contains meta information that allows different backends to build a binary that allows attaching various debuggers.
The goal of this thesis is to use this debug information and extend Sulong's implementation such that Truffle's debugging capability can be used to inspect running C/C++ code.

The scope of this thesis is as follows:

- Enrich Sulong's LLVM IR interpreter with debug information
- Implement basic debugging features, including single-stepping, breakpoints, and local variable inspection
- Provide a simple user interface

Optional goals are:

- Inspection of arbitrary data (e.g. global allocations or structure allocations)

[1] https://github.com/graalvm/sulong
[2] http://dl.acm.org/citation.cfm?id=2509581
[3] https://github.com/graalvm/

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