



Thesis-topic (BSc/MSc): InstRO Framework for FORTRAN

Hinweis: Dieses Thema kann sowohl in englischer als auch in deutscher Sprache bearbeitet werden.

Background: All performance tools for HPC systems require sampling or instrumentation to gather data, with instrumentation required to ensure guaranteed observance of events. However, current instrumentation approaches lack in flexibility and overhead control, and probe placement is either manual and tedious, or compiler-based and extremely limited. Hence, we developed InstRO (<http://www.sc.informatik.tu-darmstadt.de/instro/>), an instrumentation infrastructure written in C++ that leverages the ROSE^[1] compiler technology and its associated analysis and transformation toolset. InstRO is designed as an infrastructure for the rapid development of instrumentation tools, but also to provide reusability and extensibility independently of the used compiler. To this end, InstRO provides runtime configuration of the type of instrumentation, thus providing composability of different instrumentation features.

ROSE directly supports the FORTRAN programming language. However, the transformation and approaches of current version of InstRO lacks the capability to handle and instrument FORTRAN codes.

The goal of this project is to enhance the InstRO framework with FORTRAN support to process current state-of-the-art scientific FORTRAN based codes.

To this end, an additional InstRO specific internal adapters need to be designed and implemented to directly create FORTRAN measurement code directly in the target application.

Requirements:

- Basic knowledge of C++ and FORTRAN, or the disposition to acquire the necessary knowledge.

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[1] Daniel J. Quinlan. Rose: Compiler support for object-oriented frameworks. *Parallel Processing Letters*, 10(2/3):215{226}, 2000.