Software and Tools for Computational Engineering
RWTH AACHEN UNIVERSITY
Software and Tools for Computational Engineering
Prof. Dr. rer. nat. Uwe Naumann

Master Thesis / Bachelor Thesis / Student Researcher Position

Benchmarking C++ Codes: Profiling Template Instantiation at Compile Time

Description: Advanced C++ programming is often based on template metaprogramming techniques. With ongoing developments in the C++ language standard, complex type deduction gets even more important. Template metaprogramming is heavily used within our Algorithmic Differentiation (AD) tools. AD is a program transformation technique for the automatic generation of *adjoint codes* for a given numerical simulation program. Adjoint codes play a crucial role in sensitivity analysis and optimization. The compilation times of those transformed codes are getting more and more problematic and depending on the compiler even infeasible.

Goal: Though benchmarking the compilation process is very compiler and platform dependent, it is highly desirable in the wake of increasing template metaprogramming use. Getting reliable benchmarking and profiling data for the AD tools developed at our institute is the outcome of this thesis.

Profile: You should have worked with C/C++ and respective compilers a lot under Linux as well as Windows. In addition, knowledge in the field of numerical simulation and optimization is beneficial.

If you are interested in a bachelor or master thesis or a student researcher position (up to 19 hours a week) on this topic, please do not hesitate to contact us!

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