The High Performance Computing Group at Erlangen Regional Computing Center (HPC-RRZE) and the Chair of System Simulation (LSS) are looking for a

**Bachelor/Master thesis student for Implementation of checkpoint/restart functionality using CRAFT within the ExaStencils framework.**

The master thesis will be supervised jointly by LSS, represented by PD Harald Köstler, and by the HPC group at Erlangen Regional Computing Center, which is led by Prof. Dr. Gerhard Wellein (Department of Computer Science, FAU).

**Tasks**

**CRAFT (Checkpoint/Restart & Automatic Fault Tolerance):** This library targets to reduce the complexity of introducing application-level checkpoint/restart mechanism in programs. The user can benefit from the built-in checkpointable data types, or extend the library to make any arbitrary data type CRAFT-checkpointable.

**EXASTENCILS DSL Framework:** The ExaStencils framework allows automatic code generation from an abstract input in its own domain-specific language (DSL) ExaSlang. Its focus lies on stencil codes, especially those arising in the context of geometric multigrid solvers for partial differential equations (PDEs).

Within the bachelor/master thesis, the focus will be in the following areas:

- Checkpoint/Restart integration of CRAFT within ExaStencils
- Development of benchmark tests and applications
- Performance evaluation

**Required prior knowledge**

- Student of (computational) engineering or computer science
- Profound knowledge of code parallelization with MPI and OpenMP (as taught, e.g., in the lecture “Programming Techniques for Supercomputers”)
- Profound knowledge of C++
- Must be able to work efficiently with the Linux OS
- Very good German or/and English language skills

Please direct any inquiries or applications to

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