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Studentische Hilfskraft (m/w/d):

## Optimization of Simulation Software for Parallel Computing

October 9, 2024

### Key Aspects:

Software Design, Parallelization, Super Computing

### Task:

Our research focuses on the modeling and simulation of complex manufacturing processes using mesh-less particle-based methods, such as Smoothed Particle Hydrodynamics. Therefore, we develop our own simulation package which is written in C++ and uses object-oriented programming. Traditionally, the simulation data is structured using polymorphism limiting the ability for parallelization as the data is not stored in memory in vectors.

Therefore, we are looking for support in the effort of optimizing our data structures for parallel computing. Your job will be to design, implement, and test the data structures and continue the development to accelerate the simulation.

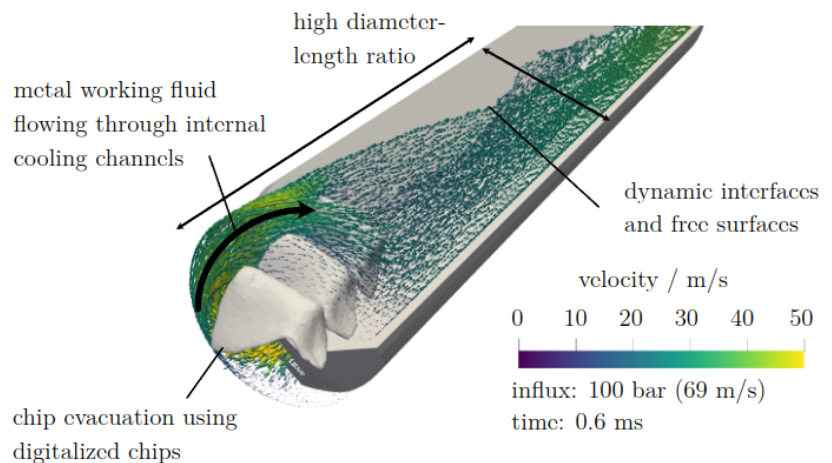


Figure 1: Example simulation: modeling of the cutting fluid in a deep-hole drilling process using a mesh-free particle-based simulation method

### Requirements:

experience with C++, good programming skills required  
experience with code versioning with git appreciated  
knowledge about software design and parallel computing is welcome  
strong self-motivation, and independent working style, reliability, problem solving skills are expected

### Scope:

8h per week, flexible working times  
employment duration for 4 months with extension possible  
payment according to university standards

### Want to hear more about it?

Contact Andreas Baumann ([andreas.baumann@itm.uni-stuttgart.de](mailto:andreas.baumann@itm.uni-stuttgart.de))  
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