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Project thesis - *Projektarbeit*

for

Vorname Nachname

Student No.: XXXXXXXXX

Thesis received: XX.XX.20XX

Workload: 150 h (5 CP)

Submission of thesis until: XX.XX.20XX

Duration: 6 months

Examiner: Prof. Dr.-Ing. U. Nackenhorst

Supervisor: Vorname Nachname,...

Automated Numerical Verification *Automatisierte Überprüfung numerischer Ergebnisse*

In industrial applications of numerical methods, the verification of computer implementations is absolutely critical. During code maintenance, previous working features could inadvertently be broken and may not be discovered until a later point in time. A modern approach for code development is to include an automated test suite that is executed for each change on the code base. This project focuses on the topic of numerical verification against analytical solutions and the inclusion of these into an automated test suite.

The student will identify test problems from the literature, create a finite element model and modify a script to extract the results and compare against the analytical solution. The scripts will undergo peer review and be placed into an automated test suite of an open-source finite element code.

Required knowledge (to be corrected with self-study when necessary):

- Programming with Python
- Creation of simple FE models
- Visualising results with ParaView / VTK

This thesis can be supervised / written in German or English.