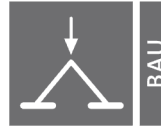


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Universität der Bundeswehr München

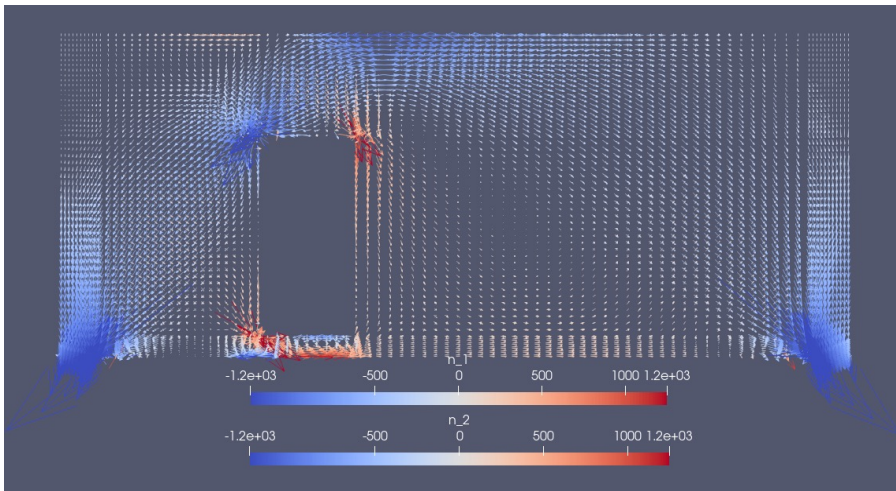
Institut für
Mechanik und Statik

Bachelor/Project thesis

This work can also be carried out as a **student job (Hiwi)**.

Visualization of principal stresses and trajectories in FEM

Stress calculations using the finite element method (FEM) are fundamental to static design. Examining the principal stresses and the corresponding trajectories helps to understand the load-bearing behaviour of a component. In addition, the principal stresses make it easier to compare results from different calculation programmes.



Principal stress trajectories of a wall with an opening

As part of the bachelor thesis, the calculation of principal stresses and principal stress trajectories is to be implemented and validated in the institute's own FE research code. The code is based on the Isogeometric Analysis (IGA), which is a special form of FEM. The code is programmed in Matlab. The focus of the thesis is the visualisation of principal stresses and principal stress trajectories in Matlab. Membrane elements should be used within this work.

Tasks:

- Review of the mechanical fundamentals
- Getting acquainted with the FE research code
- Visualisation of principal stresses and principal stress trajectories in Matlab
- Optimisation of user-friendliness (scalability, modularity, etc.)
- Validation of results