AMM / Master‘s Thesis: Physics-Based Modeling and Prediction of Mechanical and Thermal State Variables in Laser Material Processing Using Artificial Intelligence

Your Mission:

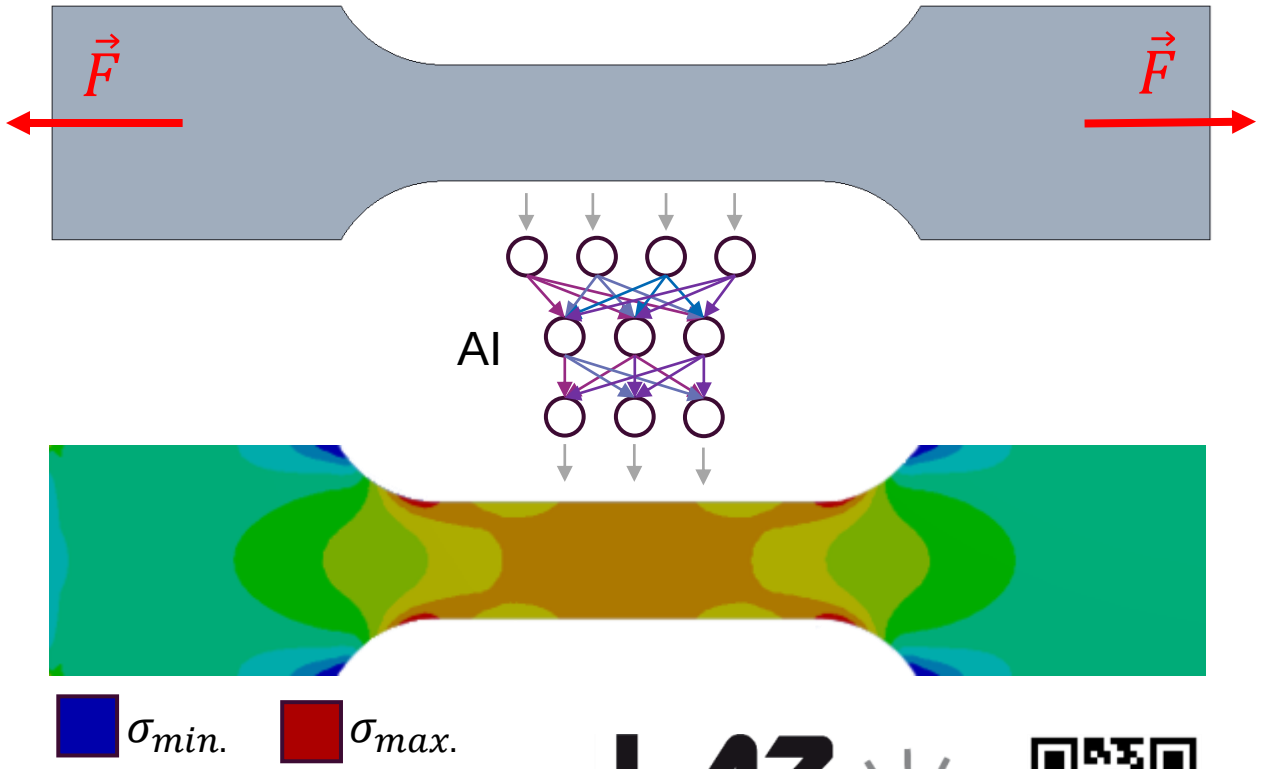
Are you interested in using machine learning to take laser material processing to the next level? In this thesis, your goal will be to integrate physical knowledge into the prediction of mechanical and thermal state variables, such as stresses, displacements and temperature. This approach aims to approximate computationally intensive FEA simulations, while simultaneously avoiding physically implausible state variables. You will first research various approaches for integrating physical knowledge into different architectures, create suitable datasets using simulation tools, prepare them and train various ML models. Join our team and help shape the future of intelligent laser material processing with your work!

Your Tasks:

- Literature review on the State of the Art
- Generation of data sets using simulation tools and their analysis
- Selection and training of Machine Learning Architectures
- Integration of physical knowledge

Your Qualifications:

- Initial experience with artificial intelligence, ideally with PyTorch
- Initial experience with FEA, ideally with ANSYS
- Enrolled student (m/f/d) at Hochschule Aalen in mechanical engineering, electrical engineering, mechatronics, or a comparable field
- Ability to work independently, creativity, commitment, and the willingness to work in a team



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