

# Bachelor's- / Master's Thesis: Physics-Based Modeling and Prediction of Machine Parameters in Laser Ablation Using Artificial Intelligence for Controlled Surface Structuring

## Your Mission:

Are you interested in using machine learning to take laser-based surface structuring to the next level? In this project, your goal will be to integrate physical knowledge into the forecasting of machine parameters. This approach aims to reduce the number of time-consuming experiments, while simultaneously avoiding physically implausible machine parameters. To achieve this, you will first research various approaches to integrating physical knowledge into different architectures, prepare datasets, and train various 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
- Expansion of existing datasets and their evaluation
- Selection and training of suitable machine learning architectures
- Integration of physical knowledge

## Your Qualifications:

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

## Supervisors and Contacts:

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