The Chair for Digital Additive Production DAP at RWTH Aachen University is closely collaborating with Fraunhofer ILT and mainly focusing in the area of Additive Manufacturing (AM). The chair aims to extend knowledge in this field and to play a strong role in the market at an international level. Therefore, advanced topics such as topology optimization, development of novel lattice structures, pre- and post-processing of AM processes along with studying advanced materials and process monitoring are main research interests in DAP. The chair is working on both industrial and publicly-funded projects in various applications such as automotive, aerospace, turbomachinery, medical and tooling industries. In addition, there is a strong team spirit in the chair and specialists with a strong background in processing, design or simulation of AM-produced parts as well as AM processes are collaborating together. Therefore, there is a potential learning environment to gain concrete experience by interacting with the people in DAP.

Bachelor-/Masterarbeit
Ingenieur-/Wirtschaftswissenschaften
Design, simulation and optimization of lattice-based support structures for the L-PBF process

Deine Aufgabe
Support structures are required in some of additive manufacturing technologies such as the L-PBF process. They transfer the laser-induced heat during the L-PBF process to the substrate plate. However, they are wastes and their reduction is desired. This motivates to use lattices as support structures. Different types of lattice structures can be used. They can also be simulated for the given mechanical and thermal loading to ensure their suitability. Afterwards, they can be optimized. This will reduce the associated costs with this Non-Value Added Process Step. Your tasks can be summarized as:

- Literature review on different types of support structures
- Design of lattice support structures for an industrial part/a case study
- Simulation and optimization of lattice structures for the existing thermomechanical loads
- Fabrication of the case study with the L-PBF process
- Documentation

Dein Profil
We are looking for a committed student with the following requirements:

- Familiarity with Abaqus/CAE
- Student of simulation sciences, computational engineering, mechanical engineering or any other comparable field of study
- Good knowledge of oral English. Documentation of the thesis can be done in English or German.