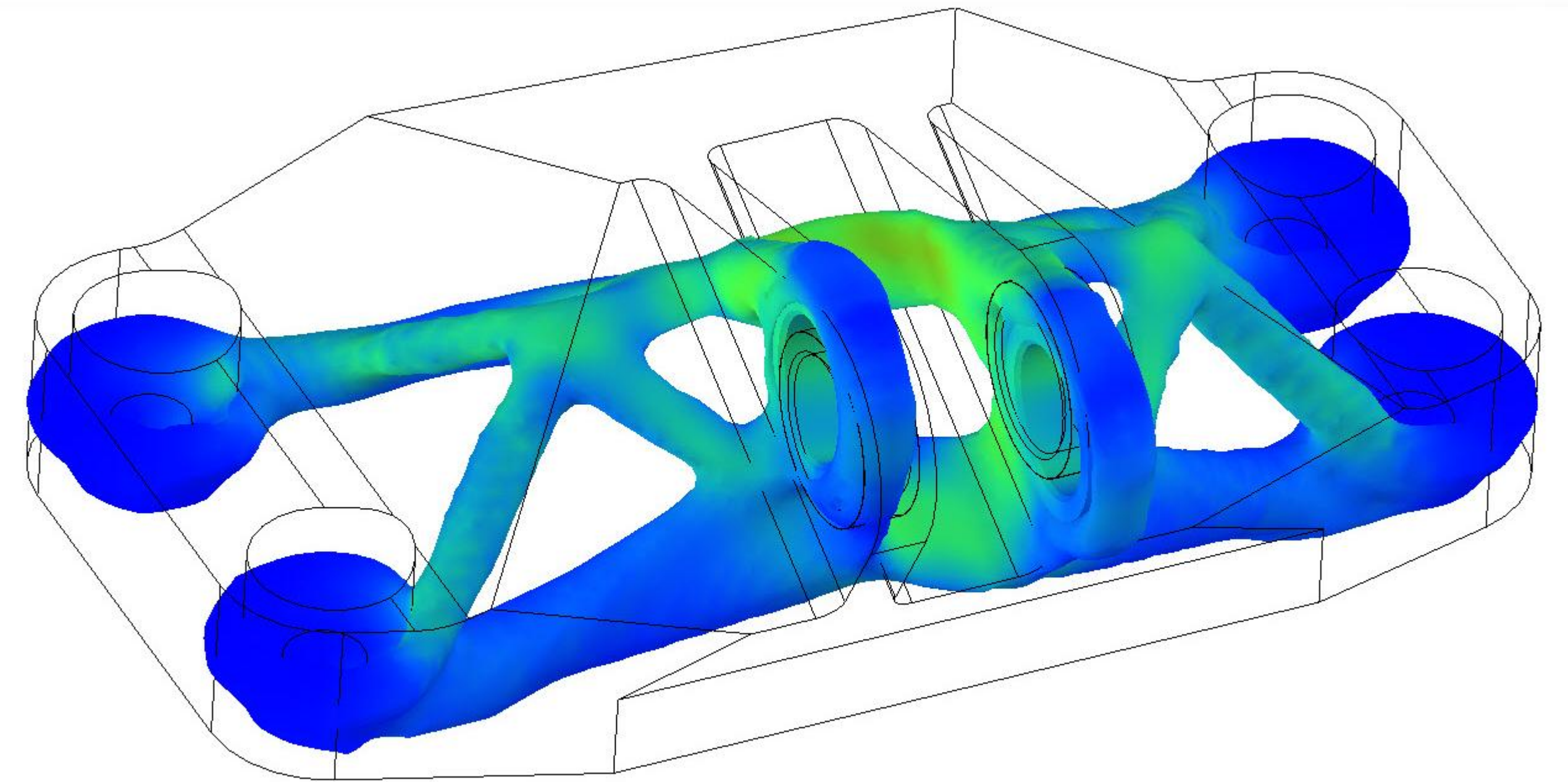
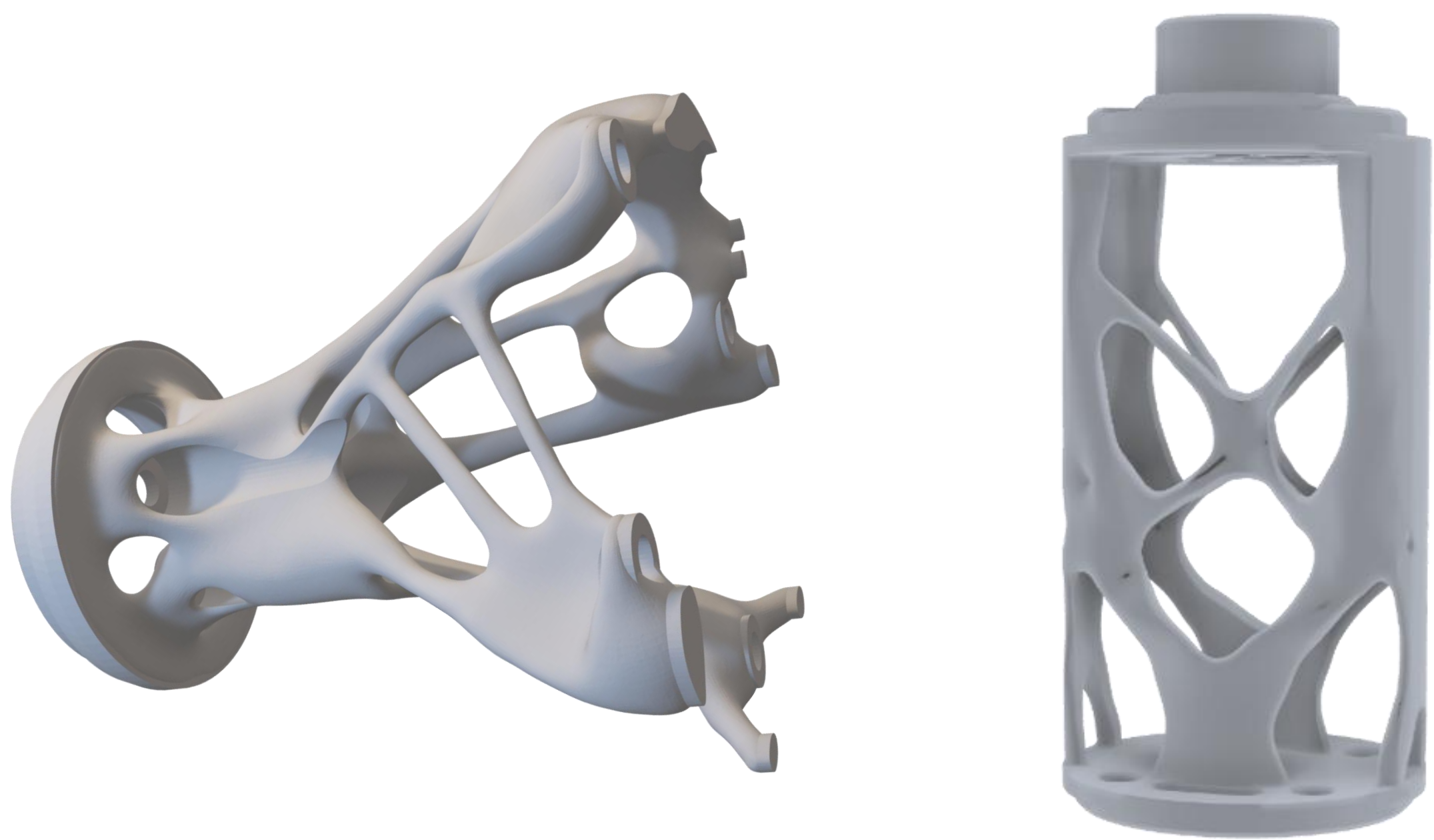


Student Research Assistant / Wissenschaftliche Hilfskraft

Development of High-Performance Tools for Topology Optimization

Keywords: Topology Optimization, Software Engineering, Computational Mechanics



Background:

Topology optimization is a powerful computational method for developing lightweight and structurally efficient components. Advancing these methods requires flexible and efficient numerical tools that support the implementation, evaluation, and validation of new optimization approaches.

This student research assistant position focuses on the development and maintenance of a Python-based topology optimization library. Tasks include implementing and extending computational tools, such as visualization functionalities and the integration of high-performance computing libraries. Further activities involve developing representative benchmark use cases, executing numerical tests, and conducting parameter studies and hyperparameter tuning to evaluate and improve algorithm performance. The work will directly support ongoing research and contribute to the development of a robust and versatile optimization framework.

Task Description:

- Development of methods and algorithms for mathematical optimization in Python.
- Benchmarking and comparison to state-of-the-art approaches.
- Proof-of-concept via detailed FEM analysis or testing.

Required skills:

We are looking for highly motivated individuals who are keen to work on industry-relevant problems.

- Computational Mechanics, Mechanical Engineering, Computational Science and Engineering or similar master's program
- Interest in topology optimization and software development
- Previous experience with Python
- Independent and reliable work

We offer:

- Insights into research on relevant future technologies
- Freedom to follow new ideas and directions
- Compensation in accordance with TUM regulations

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