

We are offering a full-time position in our lab in Garching/Munich as Research & Teaching Assistant (m/f/d) for

Design Optimization for Additive Manufacturing (PhD)

The Laboratory for Product Development and Lightweight Design focuses on the design and optimization of complex technical systems. We develop methods, tools and specific solutions to technical problems with optimal functionality, weight and cost. We are currently looking for a research/teaching assistant to design multi-component structures with topology optimization and machine learning.

Topic

Additive manufacturing offers unprecedented design freedom to optimize mechanical properties of structural components. To identify non-intuitive load paths and material distributions, modern numerical tools, such as topology optimization or AI-based generative design tools are used. Often, however, resulting optimal designs are not physically realized, because production cost and manufacturability are not acceptable or loading scenarios are not appropriately taken into account.

In our research project with an industry partner, tools are to be developed to optimize for complete and practically relevant loading scenarios and enable designers to choose from several optimal designs with an adjustable balance of mechanical properties and production cost.

Tasks

- Develop algorithms and tools for optimization, in particular topology optimization, and machine learning for the design of lightweight structures to be 3d-printed
- Contribute to lab team projects
- Support lectures and lab exercises and supervise students

Required (please explain in the cover letter)

- Master's degree in mechanical engineering, automotive engineering, aerospace engineering or similar
- Very good knowledge of technical mechanics and numerical optimization
- Fluent in German or strong commitment to learning German

We offer

- Topic with high practical relevance, challenging your understanding of mechanics fundamentals
- Interdisciplinary team
- Supervision for PhD
- Research stay abroad
- Full position as research/teaching assistant (m/w/d) with salary according to TV-L

Application

All applications received by **26.11.2023** will be considered.

Please send your application in German or English, one pdf file, reference code **TopOptAM**, by email to: applications.lpl@ed.tum.de. Please also visit our website to check for possible extensions of this deadline.

The position is suitable to be filled by severely disabled persons. Severely disabled applicants will be given preference in the case of otherwise essentially equal suitability, ability and professional performance. TUM promotes equality between women and men. Data protection notice: With your application to the Technical University of Munich (TUM), you are transmitting personal information. In this regard, please note the data protection information in accordance with Article 13 of the General Data Protection Regulation (DSGVO) on the collection and processing of personal data in the context of your application (<http://go.tum.de/554159>). By submitting your application, you confirm that you have taken note of the above-mentioned TUM data protection information.



Fig. 1: Lightweight optimized and additively manufactured components: (a) Screw grippers (b) engine bracket.

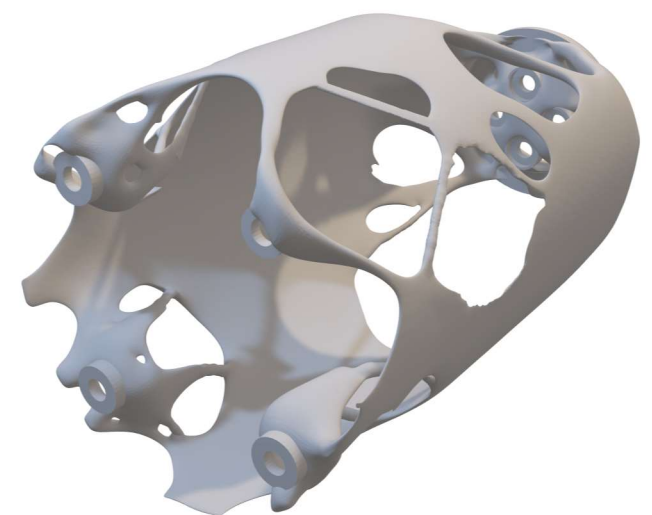


Fig. 2: Topology optimization of screw connections