

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

Topology optimization and machine learning for the design of multi-component structures with applications in robotics (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

When designing mechanical structures, known forms such as e.g. standard profiles, are used. This supports manufacturability and low costs, but at the same time limits optimality in terms of weight and function. In contrast, so-called top-down approaches aim at technical solutions whose components are defined as little as possible in advance. An optimal, previously unknown form of mechanical structures can be determined via topology optimization purely according to functional criteria or weight. Specially trained machine learning algorithms serve as estimators for manufacturability, costs and weight. These methods are used in several projects, e.g., in the design of new lightweight structures for robots.

Tasks

- Develop methods and algorithms for optimization (especially topology optimization) and machine learning for the design of lightweight structures
- 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
- Solid knowledge of technical mechanics, numerical optimization and machine learning
- Fluent in German or strong commitment to learning German

We offer

- Innovative topic, interdisciplinary team, possibility to graduate with a PhD degree, stay abroad
- Full position as research/teaching assistant (m/w/d) with salary according to TV-L

Application

All applications received by **12.03.2023** will be considered.

Please send your application (reference code TopOpt) by email to: applications.lpl@ed.tum.de.

Please visit our website to check for extensions of the deadline.

Disabled people are given preference if they are equally suitable and qualified. TUM promotes equality between women and men. **Data protection notice:** With your application to the Technical University of Munich (TUM), you are submitting personal information. In this regard, please note the data protection information in accordance with Art. 13 of the General Data Protection Regulation (GDPR) on the collection and processing of personal data as part of your application (<http://go.tum.de/554159>). By submitting your application, you confirm that you have taken note of the TUM's data protection information mentioned above.



Fig. 1: Lightweight optimized multi-component system

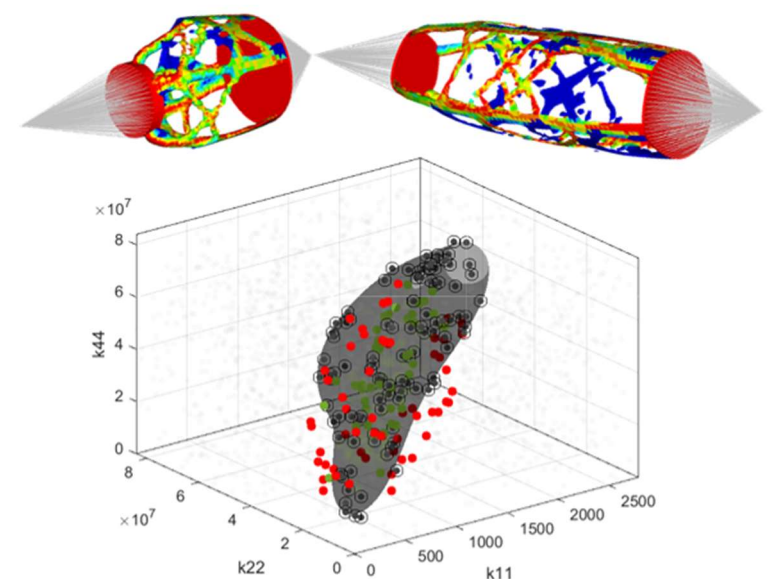


Fig. 2: Above: Optimized components
Bottom: Space of feasible component properties estimated via a Support Vector Machine