Student thesis

Method development for topology optimization for coreless wound fiber composite lightweight structures

Student (m/f/d) Mechanical Engineering, Computer Science, Lightweight Construction or similar.

application deadline
May 6, 2023

start
as of now

duration
4 – 6 month

workplace
Denkendorf

Job Description
The Institute for Textile and Fiber Technologies (ITFT) of Stuttgart University conducts research in the future-oriented field of coreless winding technology for fiber composite structures.

As part of a research project with partners from industry and research, an existing fiber composite structure is to be numerically optimized and manufactured using coreless winding technology. The focus is on the simultaneous consideration of design, material specific and manufacturing aspects during the development of the topology optimization tool. After a short familiarization phase, you will further develop such a tool and work out basic solution concepts for a real component. Finally, you will perform structural failure tests to verify the model. This will be done in direct cooperation with our partners and your ITFT supervisor. Your working hours and the possible part in the home office can be arranged flexibly. Collaborative publishing in peer-reviewed journals is strongly encouraged. An interview will take place on site together with the project leader of the research partner at DITF Denkendorf.

Tasks
The work mainly includes the following points:
• Programming a topology optimization tool for coreless filament winding in Python.
• Shape finding, fabrication and structural testing of fiber composite components.

Qualifications
• Interest and intrinsic motivation for fiber composite technologies in lightweight construction
• Solid knowledge of Python 3
• Basic knowledge of CAD software, preferably Autodesk Fusion360
• Craftsmanship skills in fiber composites preferred

The University of Stuttgart emphasizes the compatibility of private life, family and career as well as equal opportunities for persons of all genders. Disabled individuals are given preference in the case of equal suitability.