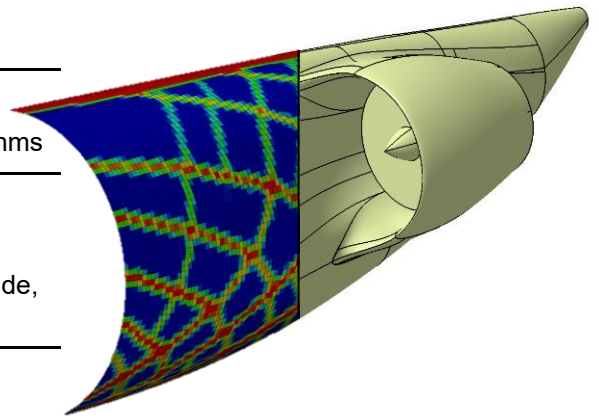




Student assistant: Software development for structural optimisation of lightweight structures

Subject area	Advancement of a Finite Element Method (FEM) solver for topology optimisation using the Isogeometric Analysis (IGA)
Focus areas	Software development for computational engineering, development of optimisation algorithms
Contact person	Maximilian Friedrichs-Dachale, M. Sc. IFL Room 022 maximilian.friedrichs-dachale@tu-braunschweig.de, Tel. 0531 / 391 26
Requirements	- You study Computer Science, Math, CSE, Aerospace Engineering or similar - Good programming knowledge (preferably C++) and version control expertise - Finite Element Method knowledge is beneficial - Independent way of working



With regard to the goal of reducing emissions in aviation, the IFL is researching potentials and synergies through highly integrated aircraft development. This requires a closer integration of design and analysis models. In this context, we are enhancing a multiphysics framework for the rapid design of aircraft structures using topology optimisation. The aim is to determine an optimal layout of the stiffening structures in order to save as much structural weight as possible (see photo).

If you would like to expand your knowledge of lightweight construction, FEM and optimisation algorithms and further develop your programming skills during your studies, this is just the right opportunity for you. You can also gain exciting insights into the world of isogeometric analysis (IGA). This is a promising further development of the classic FEM, which combines models for design and analysis and is therefore particularly useful for structural optimisation.

Possible tasks are

- Further development of the multiphysics framework
- Development of algorithms for structural optimisation (e.g. Bayesian optimisation, adaptive growth methods)
- Support for the automation of pre- and post-processing

If you are interested, please do not hesitate to send me your application documents via mail.