Forschungspraxis/Research internship

Thesis Opportunity: Validation of Static Prebending Measurements of MEMS Structures Using Finite Element Method

Thesis Topic:

We are seeking a motivated student eager to work with Finite Element Method (FEM), with a focus on fitting finite element models of MEMS (Micro-Electro-Mechanical Systems) structures to existing measurement data of static bending profiles. MEMS structures usually consist of layer stacks. After the fabrication the MEMS experiences static prebending due to the residual stress induced in the layer stack. Thus, it is essential to validate the FEM models with the measurement data in order to get the correct residual stress in the layer stack. This research project aims to explore the validation of using FEM techniques and compare them with measurement data.

Key Responsibilities:

- *Literature Review:* Possibilities of fitting stress parameters to a MEMS layer stack.
- *Finite Element Analysis*: Utilize FEM software to validate the layer stack with the measurement data.
- *Documentation:* Document the entire research process, including methodology, simulation results, and conclusions.

Qualifications:

- Currently enrolled in a relevant degree program (e.g., Electrical Engineering, Mechanical Engineering, or similar fields).
- In best case solid foundation in mechanics and finite element analysis.
- Experience with FEM software tools (e.g., COMSOL).
- (optional) Proficient in CAD software and 3D modeling.

How to Apply:

If you are passionate about MEMS, mechanics, and FEM and eager to contribute to innovative research, we encourage you to apply for this thesis opportunity. Please send your resume and your academic transcripts to **christian.goerner-tenorio@tum.de**.