

Bachelor thesis, master thesis, project thesis

FEM simulation and validation of air gap measurements in e-motors

The MotorInspector project aims to automate air gap measurements in the quality assurance of innovative axial flux electric motors using innovative digital measurement methods and robotics.

In this thesis, this measurement process, which is carried out using the contact-based, mechanical gap measurement sensor MFP GapMaster, will first be simulated under various boundary conditions and then validated in real-world tests.

ANSYS Mechanical or another software of your choice will be used as FEM simulation software.

Your tasks

A precise CAD model of the sensor already exists, so the following work packages have been defined for the simulation-based investigation of the measurement:

- Setup of the simulation in the FEM software, including modeling of the test gap, material assignment, and meshing of the sensor model
- Definition of reference points for recording the strain on the sensor
- Performing a simple simulation for measurement under optimal boundary conditions at different gap thicknesses.
- Performing the simulation in the previously defined measurement scenarios under changed boundary conditions (twisting, tilting, displacement of the sensor)
- Analysis and visualization of the results
- Optional: Planning and performing validation tests on the test bench

Depending on personal interest and level of knowledge, these work packages can be adjusted.

Your profile

What you bring to the table:

- You are studying mechanical engineering, mechatronics, industrial engineering, or similar
- Good knowledge and one to two completed projects in FEM software (preferably ANSYS Mechanical)
- Interest in simulation, practical experimentation, and measurement technology
- Analytical thinking, structured approach to work, and independence
- Good written and spoken German and/or English skills

If you are interested in combining FEM simulation and practical validation, then you have the perfect prerequisites for a thesis in this project!

We offer

- Independent work
- Flexible working hours
- Well-equipped workplaces
- Home office by arrangement

- Test implementation
- Long-term cooperation



Bitte sende deine aussagekräftige Bewerbung in einer einzigen PDF-Datei an jobs@iph-hannover.de.

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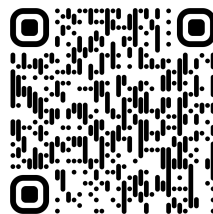
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