

PhD Position – Experimental Tribology

Research Topic	Design and instrumentation of a novel large-scale TEHL bearing test rig.
Institute	Ghent University, Belgium
Departments	EEMMECS - Dept. of Electrical Energy, Metals, Mechanical Construction, and Systems
Research Group	Soete Laboratory.
Funding	4 years – 100% occupancy rate
Statute	PhD Student
Min. Requirements	Master of Science in Mechanical Engineering.
Assets	Experience with electro-mechanical design , Tribology, and instrumentation.

Job description

Context – Gears and roller bearings are still key components in modern mechanical drivetrains, regardless whether used in automotive, industrial machinery or wind turbine applications, because of the ever increasing demand for more power density. The lubricated contact conditions between these high-precision components largely determine the global performance, reliability and durability of the entire machine and therefore affect the Total Cost-of-Ownership (TCO), due to 1) primary hardware costs, 2) secondary costs related to performance decrease over lifetime, maintenance, repair, downtime, outage and failure and 3) to power consumption. In this context, understanding and optimizing the lubricant film in the bearing/gear-pair is vital to guarantee performance and durability, and reduce TCO.

In current project we envisage to develop an novel concept for measuring Thermo-Elastohydrodynamic Lubricated (TEHL) contacts between metallic bodies, which differs from the conventional ball-on-glass tribometers and classic interferometry.

Your job is to design and develop in collaboration with our technical team an innovative large-scale mechanical bearing test setup with the aim to perform detailed and accurate in-situ measurements of the pressure and temperature distributions as well as spatial film thickness in highly-loaded closed metallic TEHL line-contacts, operating under controllable dynamic loads, accelerating/decelerating rolling-sliding motions, and well-controlled lubricant conditions. Moreover, the new test setup must be instrumented with a novel type of small sensors for measuring relevant physical parameters. Once established, experiments will be done to investigate in detail TEHL under dynamic conditions.

Profile

1. You hold a Master degree in Electro-Mechanical Engineering.
2. You have a strong motivation for conducting scientific research at a high level.
3. You possess good analytical, and technical skills.
4. You have experience with electro-mechanical design and instrumentation.
5. You are interested in, or have affinity with Tribology.
6. You have excellent communication skills in English, both orally and written.
7. You are proficient in Dutch, or alternatively French, German or Spanish.
8. You take responsibility for the development of your project in a well-structured, thorough way, and you're able to solve problems independently. You display creativity in solving problems, generating ideas or finding new ways of working.
9. You have an open personality and willing to contribute to the team and participate in didactic projects.

Contract

1. The PhD-position is immediately available.
2. We offer an 100% research position for 48 months (4 years). After probation period of 12 months, a fixed-term contract will be offered on condition of positive evaluation.
3. The salary and appointment terms are consistent with the current rules for PhD degree students. The net salary for a starting PhD student (unmarried) is about €2000,-.
4. The scholarships for the PhD degree are subject to academic approval. The successful candidate will be enrolled in the doctoral program of Ghent University (<http://www.ugent.be/doctoralschools/en>).

Application

For further information on the project and/or application, please contact Prof. Dieter Fauconnier (dieter.fauconnier@ugent.be).