

## PhD Position – Experimental tribology of lubricated contacts

<b>Research Topic</b>	Experimental tribology of lubricated gears and bearings
<b>Institute</b>	Ghent University, Belgium
<b>Departments</b>	EMSME - Dept. of Electromechanical, Systems and Metal Engineering
<b>Discipline</b>	Experimental Tribology
<b>Research Group</b>	Soete Laboratory.
<b>Funding</b>	4 years – 100% occupancy rate
<b>Statute</b>	PhD Student
<b>Min. Requirements</b>	Master of Science in Mechanical Engineering
<b>Assets</b>	Experience with test rig design

### Job description

**Context** – High performant and power dense electromechanical systems (e.g. weaving looms, compressors, gearboxes, drivetrains, ...) need oil lubrication to reduce friction and resulting wear in a contact between two surfaces and to efficiently dissipate heat from the contact points.

On the one hand, these systems contain multiple oil lubricated bearings of various types, which typically operate under different and/or varying conditions (load, speed, temperature). Ideally the lubrication properties have been adapted to these operating conditions. However, in practice each individual bearing operates under suboptimal lubrication conditions, leading globally to an increased Total Cost of Ownership (TCO) due to reduced energy efficiency, reduced component lifetime and increased maintenance and downtime. At Ghent University, techniques are being developed to actively control and optimize the local lubricant thermomechanical properties. On the other hand, proper lubrication of gears is extremely important in a number of industrial applications, including wind turbines and automotive. A plethora of diagnostics indicators, based on signal processing and machine learning applied on indirect measurement techniques (e.g. acceleration, sound, rotational speed, etc.) have been proposed to monitor the damage evolution in gears but rarely are compared with a direct damage measurement based on camera images.

In this project, detailed experimental tribology studies of lubricated contacts (bearings and gears) will be performed to gain understanding of the mechanisms at play in lubricated contacts in state-of-the-art electromechanical systems.

**Your tasks** – The envisioned PhD focusses on the development of experimental methodologies to study the behaviour of lubricated bearings and gears at realistic dynamic operating conditions. Test rig design and proper instrumentation of test rigs will be an essential task to enable measuring the relevant properties. This will go hand in hand with modelling efforts that are ongoing within the research group. The candidate will be in close contact with collaborators in Flanders.

### Your 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 affinity with Tribology.
5. 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.
6. You have an open personality and willing to contribute to the team and participate in didactic projects.
7. You have excellent communication skills in English, both orally and written.

### Contract

1. The PhD-project starts at earliest at May 1<sup>st</sup> 2021.
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

To apply, please complete the application form at <https://forms.gle/EBdpjN9YttYcdbmq9> . Your application will be taken into consideration on condition that all fields in the application form are completed properly.