

Bachelorthesis/Masterthesis/Project Module

Investigations on structural vibrations using MEMS inertial sensors in electrically active implants

As part of the Collaborative Research Centre 1270 (ELAINE - EElectrically Active ImplaNts), the institute is working on the modelling and design of implants with very low energy consumption. Our goal is to investigate the effects of mechanical vibrations and motion on the reliability of implants. We also want to monitor the condition of the implant during use.

To achieve this goal, we want to record these vibrations and motions using MEMS inertial sensors. One advantage of MEMS technology is its compact design, which allows the development of very small electrically active implants. In addition, the ultra-low power consumption could allow the use of energy harvesting systems to power the system.

There are several open tasks in this project that can be explored in a refined version during a thesis or project module:

- Research, testing and evaluation of useful sensors
- Design, development, and evaluation of a prototype application platform
- Research, implementation, and evaluation of sensor data analysis algorithms
 - Activity detection
 - Monitoring the state of the implant
 - Detection of anomalies
- Investigation and evaluation options for minimizing power consumption.

If you would like to learn more about the individual tasks or are interested in working on one of the topics, please contact Nico Schumacher.

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