



Development of a data transfer system for bidirectional communication between internal and external components of a transcutaneous inductive energy transmission path

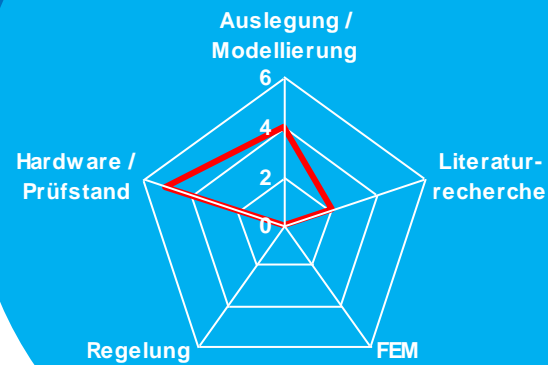
Inductive energy transmission in medical technology is not only used for hearing or visual implants, but also has great potential for systems with higher power requirements, such as heart pumps in the 5-20 W range. As the use of batteries is not possible here, these implants are currently supplied with energy via cable led through the abdominal wall. To get rid of this driveline, the ieuw is conducting research into contactless inductive energy transmission through the skin (transcutaneously). This will reduce the risk of infection for patients and improve their quality of life.

In addition to energy transmission, bidirectional data transmission is also necessary to ensure system monitoring and safety. This must meet special requirements due to the application on and in the human body: the lowest possible energy consumption and the smallest possible installation space are important.

Bluetooth Low Energy is suitable for this application due to its suitable range and low energy consumption.

In the scope of this work, such a data transmission link based on Bluetooth Low Energy (BLE) is to be set up.

A user interface is to be implemented with use of Matlab App, with which parameter values such as battery voltage and pump speed of the implanted components can be read out. At the same time, it should be possible to control the pump speed via a controller on the user interface.



Studenten Profil:

- Independent, motivated way of working and self-initiative
- Basic knowledge of Matlab programming
- Previous knowledge in the field of radio data transmission
- Motivation for practical setups
- Talent and interest in structuring complex subject areas
- Interest in the field of medical technology and functionality of active implants

Aufgaben und Zeitplan:

- Familiarization with the topic of BLE, especially for medical applications
- Familiarization with the programming of data transmission paths with Matlab (Bluetooth low-energy communication)
- Implementation of a Matlab app for the visualization of bidirectional data transmission
- Hardware design and setup
- Written elaboration and final presentation

