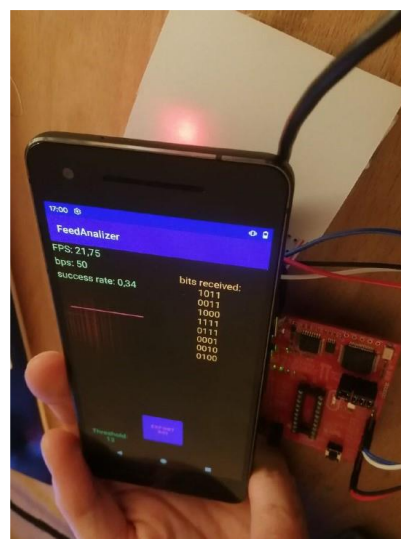


Specialization/Project Module, Bachelor thesis, Student Job

Enhancing and Evaluation of an Optical Camera Communication (OCC) system for medical electrically active implants

Within the Collaborative Research Center 1270 ELAINE (ELectrically Active ImplANts) the University of Rostock focuses on novel electrically active implants. Our objective is to establish innovative energy autonomous implants that allow a feedback-controlled electrical stimulation.

The current version of a deep-brain stimulation implant contains a small LED, intentionally used to signal the implant's state directly to the human eye. Using a visible light communication scheme with an ordinary smartphone on the receiving end, the information throughput can be significantly extended. This allows for example to manually monitor vital information of living animals during in-vivo experiments without the additional costs (i.e. size and energy) of common wireless technologies. To test and evaluate this method, a working prototype has been implemented successfully.



Various tasks to enhance and evaluate the system are open to be worked on within project modules, as bachelor thesis or student jobs, such as:

- Implementing & evaluating different modulation schemes on the transmitter and receiver site
- Implementing the decoding algorithm in C/C++ using the Android Native Development Kit
- Evaluate the performance and data throughput using smartphones with cameras that are able to capture 60 to 120 frames per second
- Develop an end-user friendly interface for the medical staff during in-vivo experiments
- Integrate the transceiver algorithm into the current firmware of the deep-brain stimulation implant

If interested in one or more of these tasks, please contact Maximilian Koschay.

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