Master Thesis

Interface for Wireless Powering of Biomedical Brain Implants

Biomedical brain implants need to be powered wirelessly to avoid the implantation of cables. The power is transmitted by means of radio frequency interaction between an implanted coil and an external coil which is the power transmitter. The RF power transmission system can be represented by a RLC network as outlined in Figure 1. In order to harness as much as possible power via the implanted power receiver a well-designed power management is needed. This interface has to adjust for the optimal load impedance of the RLC network enabling highly efficient energy harvesting. Therefore, the power management needs to be realized by a smart implementation allowing the load matching as well as the efficient buffering of the extracted energy. Currently, two promising energy conditioning concepts are under investigation.

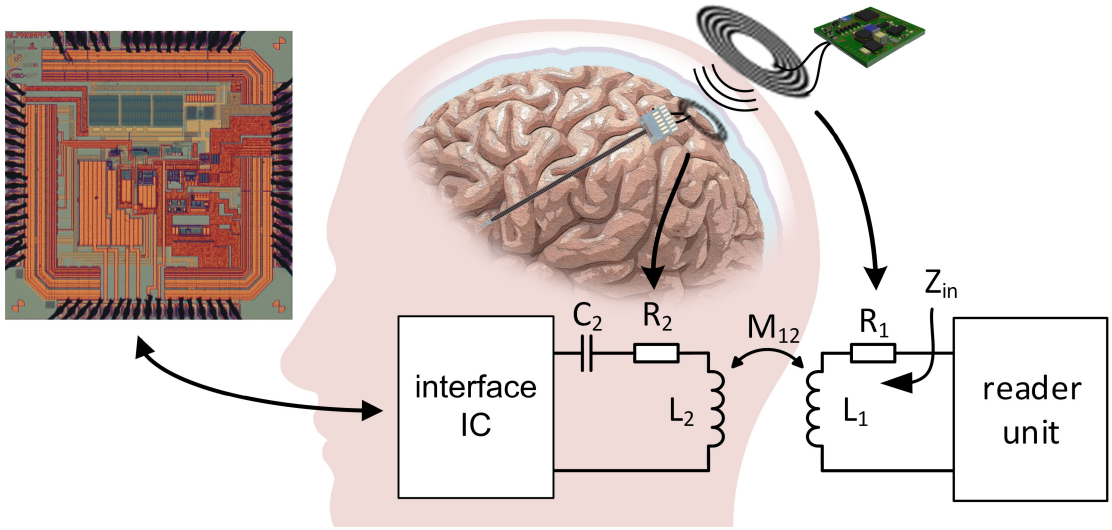

Figure 1: Overview of the wireless power transmission system.

In the proposed master thesis topic these two concepts need to be evaluated at first. Based on this evaluation the more favourable concept is to be implemented circuitry-wise in a standard CMOS technology. Finally, the work has to be documented by preparing the master thesis.

What we expect: Interests in the design of electronic circuits, willingness to familiarise with the topic and the needed design tools, well documented work, and teamwork.

What we offer: Intensive supervision of the thesis, nice work environment in a teamwork, latest simulation software tools, electronic design automation tools, excellent lab equipment, and free space for own ideas.

Starting date: As soon as possible.

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