Universität Rostock Traditio et Innovatio

Bachelor Thesis
Effect of nerve geometry on the pulse propagation

Project description:

The purpose of this project is to study the speed of the pulse, propagating in the nerve with respect to the anatomy of the nerve. It is known that the pulse propagates faster in thin nerves and slower in larger diameters of nerves. In order to find out the exact mechanism of pulse propagation along the nerves, we would like to investigate the pulse propagation speeds within the nerve, not just in electrical sense but also in mechanical terms.

The aim of this work is to

- Solve coupled differential equation systems in Matlab/Python
- Perform parametric study with respect to radius and speed of pulse
- Hypothesize the possible pulse propagation in different scenarios

Students who are interested in working on this project should have

- interest in bio-electromagnetics
- good experience with Matlab or Python
- Interest in differential equation systems
- ability to solve problems in an autonomous manner

References:

1. R. Appali, Modeling the coupling of action potential and electrodes, PhD dissertation, 2013
DOI: 10.18453/rosdok_id00001258

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