Internship Imaging - SPM
Biomedical Engineering/ Applied Physics/ Electrical engineering (master)

Company information
Artinis Medical Systems is a young Dutch innovative company working in the field of medical research and quality assurance. We produce gold standard x-ray phantoms for quality control in radiology and mammography. We also manufacture the OXYMON, a non invasive optical imaging device to monitor oxygen supply in living tissue, and the PortaMon, our wireless NIRS device.

We aim to provide our clients worldwide with superior fit-for-purpose solutions, R&D support, comprehensive training and effective after-sales support. We can do so based upon our extensive knowledge of the field and the close co-operation with expert groups in scientific institutions. For our products we are independent and are therefore able to choose the best components available on the market.

Subject
Optical oximetry, and near infrared spectroscopy (NIRS) in specific, is a tool for the assessment of the oxygenation status and hemodynamics of various organs, e.g. muscle and brain. NIRS relies mainly on two characteristics of human tissue. Firstly, the relative transparency of tissue for light in the NIR range, and secondly, the oxygenation dependent light absorbing characteristics of hemoglobin. By using a number of wavelengths the relative changes in concentrations of the hemoglobin’s can be displayed continuously. One of the applications of NIRS is Functional brain monitoring (fNIRS), like measuring the response of brain oxygenation to a sensory stimulus.

Assignment
Statistical parametric mapping provides activation maps of oxy-, deoxy-, and total-hemoglobin and allows for activation localization: it makes images of the brain by modeling by near-infrared spectroscopy. We like to integrate this for different setups in our software program. There are already software programs (in Matlab) to make the maps for a standard setup. The assignment would be to make SPM in combination with the oximetry software available for multiple setups in an easy to use way, including documentation.

Requirements
- Extensive Matlab Programming skills
- Knowledge about imaging
- Statistics

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