Lecture "Mathematische Methoden zur EEG/MEG Rekonstruktion und TES/TMS Manipulation neuronaler Netzwerke im menschlichen Gehirn - Teil I", Wintersemester 2018-2019:

Verantwortlich: Wolters
Begleitend: Kellinghaus/Kugel/Möddel/Muhle:

QISPOS:
https://studium.uni-muenster.de/qisserver/rds?state=verpublish&status=init&vmfile=no&publishid=270792&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung

Lecture scriptum: http://www.sci.utah.edu/~wolters/LiteraturZurVorlesung/Vorlesungsskriptum/vorlesungsskriptum.pdf

Time: 16: 00 to 17:30

Tues., Oct.9, 2018: No lecture (Wolters in Chengdu/China)

Tues., Oct.16, 2018: **Wolters:** Preliminary discussion, introduction and motivation

Tues., Oct.23, 2018: **Wolters:** Basics of Electro- (EEG) and Magnetoencephalography (MEG)

Tues., Nov.30, 2018: **Wolters:** Maxwell equations and physical modeling in bioelectromagnetism (EEG, MEG, TES, TMS)

Tues., Nov. 6, 2018: **Wolters:** Basic mathematics for bioelectromagnetism (EEG/MEG, TES/TMS): Scriptum chap 6.1.1 – 6.1.5 (Analysis of the potential equation)

Tues., Nov. 13, 2018: **Wolters:** Basic mathematics for bioelectromagnetism (EEG/MEG, TES/TMS): Scriptum chap 6.1.6 (Variational formulation, existence and uniqueness of a solution), 6.2 (Analytical solutions in simplified geometries), 6.5.1-6.5.4 (Finite element method (FEM) for the bioelectromagnetic forward solution)

Tues., Nov. 20, 2018: **Wolters:** Numerical mathematics for bioelectromagnetism (EEG/MEG, TES/TMS): Scriptum chap 6.5.5-6.5.7, Chap.7 (Fast FEM solutions), 6.5.8-6.5.10 (Validation of numerical procedures in simplified geometries)

Tues., Nov.27, 2018: **Wolters:** Numerical mathematics for bioelectromagnetism (EEG/MEG, TES/TMS): Scriptum chap 6.5.10-6.5.14 (Validation in simplified geometries and sensitivity in realistic head geometries)

Tues., Dec.4, 2018: **Kugel:** Introduction to magnetic resonance tomography (MRI)

Tues., Dec.11, 2018: **Wolters**: Parametric registration of MRI

Tues., Dec.18, 2018: **Wolters:** Non-parametric registration of MRI

Tues., Jan.8, 2019: **Wolters**: Segmentation of MRI

Tues., Jan.15: **Wolters**: Mathematics for the inverse problem in EEG/MEG

Tues., Jan. 22: **Wolters**: EEG/MEG source analysis for the reconstruction of somatosensory and auditory evoked responses and in presurgical epilepsy diagnosis

Tues., Jan.29, 2019: **Kellinghaus**: Basics of epilepsy and EEG

Tues., Feb.5, 2019: **Möddel:** Epilepsy surgery (Wolters on ChildBrain conference in Leuven/Belgium)