Kolloquium
Biomedizinische Technik und verwandte Gebiete

Sommersemester 2016

Donnerstag, 12.05.2016, 17:00 - 18:30 Uhr

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(Moderation: Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt, Lehrstuhl für Medizinische Informationstechnik (MedIT) im Helmholtz-Institut für Biomedizinische Technik der RWTH Aachen)

„The Power of Matrix and Tensor Decompositions in Smart Diagnostics"

Abstract:

Accurate and automated extraction of clinically relevant information from patient recordings requires an ingenious combination of adequate pretreatment of the data (e.g. artefact removal), feature selection, pattern recognition, decision support, up to their embedding into user-friendly user interfaces.

The underlying computational problems can be solved by making use of low rank matrix and tensor decompositions as *building blocks* of higher-level signal processing algorithms. A major challenge here is how to make the mathematical decompositions ``interpretable'' such that they reveal the underlying medically relevant information and improve medical diagnosis. The addition of relevant constraints can help to achieve this.

The application of these decompositions and their benefits will be illustrated in a variety of case studies, including brain tumor tissue differentiation, epileptic seizure onset localisation using adult and neonatal scalp EEG and Event-related potential analysis during simultaneous EEG-fMRI acquisition.

For more information and additional references, see www.esat.kuleuven.be/stadius/

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