

Kolloquium

Biomedizinische Technik und verwandte Gebiete

Wintersemester 2015/16

Donnerstag, 28.01.2016, 17:00 - 18:30 Uhr

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(Moderation: Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt,
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„Non-invasive stroke volume assessment using thoracic bioimpedance – advances in impedance cardiography“

Abstract:

Monitoring the human stroke volume or cardiac output non-invasively is a challenging task which has kept scientists and researchers occupied for decades. Impedance cardiography (ICG) provides the possibility to estimate the stroke volume using a harmless alternating current injected into the body.

This work presents new research in this field. A new application area in medical care is introduced with a wearable impedance cardiograph integrated into a shirt for home monitoring in a personal healthcare scenario. In addition, physiological sources contributing to the impedance waveform were analyzed using a finite element model and simulations. With this model, certain negative influences of pathologies on the measured impedance were identified and verified by results obtained from a clinical trial. In addition, improved algorithms to assess characteristic points from the impedance cardiogram were introduced, performing better than those in a commercially available reference device. And last but not least, completely new application areas outside classical medical care scenarios were made accessible by human trials.

