

# Kolloquium

## Biomedizinische Technik und verwandte Gebiete

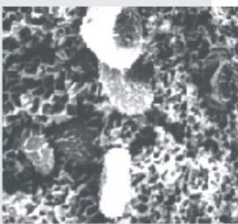
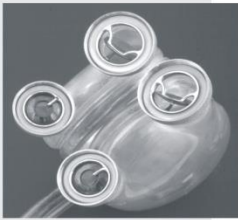
**Wintersemester 2017/2018**

**Montag, 19.02.2018, 10:30 – 12:00 Uhr**

**Dipl.-Ing. Christoph Hoog Antink**

*vom Lehrstuhl für Medizinische Informationstechnik, RWTH Aachen*

(Moderation: Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt,  
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### „On Sensor Fusion for Multimodal Cardiorespiratory Signals “

#### **Abstract:**

Sensor fusion describes the joint analysis of information from multiple sources and is vital to several areas. While automated sensor fusion is highly developed in many technical domains, for example navigation, it can be considered to be in an infant state in the medical realm. In this work, contributions to the field of sensor fusion for cardiorespiratory signals were made in three important subdomains.

In terms of signal modeling, a universal synthesizer was developed that allows the representation of arbitrary cardiorespiratory signals. Based on a system of coupled oscillators, signals with both deterministic coupling and realistic statistical distributions could be obtained and validated for several modalities.

With respect to fusion algorithms, approaches were developed for unobtrusive sensing, beat detection in medical data, and false alarm reduction in the intensive care unit. For the latter, novel features were combined with machine learning strategies and achieved promising results in an international competition.

Finally, to examine an application scenario in the area of unobtrusive sensing, an armchair was equipped with several sensors. In a study using motion capture, the influence of motion artifacts on unobtrusive sensing modalities and the potential of sensor fusion for monitoring vital signs were analyzed and demonstrated.

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