

Kolloquium

Biomedizinische Technik und verwandte Gebiete

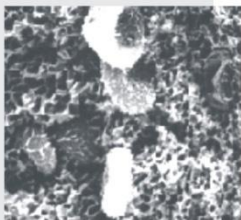
Sommersemester 2018

Freitag, 06.04.2018, 10:00 – 12:00 Uhr

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vom Lehrstuhl für Medizinische Informationstechnik, RWTH Aachen

(Moderation: Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt,
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„Body Temperature Assessment for Improving Clinical Monitoring and Care in Neonatology“

Abstract:

Approximately one-tenth of all live births worldwide are premature. In contrast to full-terms, infants born prematurely have underdeveloped biological and physiological systems. This functional immaturity commonly leads to complications such as temperature instability, respiratory distress, cardiovascular disorders etc. Therefore, monitoring of vitals, including heart rate (HR), respiratory rate (RR) and body temperature, is required in clinical care of preterms.

Nowadays, standard monitoring relies on contact-based or even invasive methods. Unfortunately, these procedures cause stress and may even damage the vulnerable skin of the infants. For these reasons, remote monitoring techniques such as infrared thermography (IRT) have a high probability to play a revolutionary role in the future.

This work introduces new innovative tools that aim at improving monitoring and care in neonatology. A new lumped model of the thermoregulatory system of infants was developed and validated with clinical data. In addition, new approaches to obtain cardiorespiratory signals out of thermal videos were introduced. For RR monitoring, the temperature modulation around the nostrils and the movement of the thorax were considered. The principle of HR estimation relies on periodic movements of the head and the thorax caused by cyclical ejection of blood out of the heart. Lastly, this work examined the capability of IRT to detect and assess circulation and perfusion disturbances.

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