

CBME Seminar



Seminar Title: Smelling diseases with an electronic nose system

Presenter: Prof Andreas Voss
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Date and Time: 11th May 2011 (Wednesday) at 4.10 PM

Venue: Innova21 Building, Basement Level, Room B19

Site Map: http://www.adelaide.edu.au/campuses/mapscurrent/north_terrace.pdf

Abstract

The human body odor is composed of volatile organic compounds. This composition might be altered in a range of diseases. The aim of our research is to examine the possibility of applying an electronic nose to quantify changes in human body odor. The electronic nose system consists of an array of three thick-film metal oxide based gas sensors with heater elements. Each of the sensors has a slightly different sensitivity to various odorant molecular types. Interactions between molecules and the sensor are caused by reactions with oxygen on the heated sensor surface, leading to a change in free charge carrier concentrations and thus to a change in conductivity in the metal oxide layer. The sensor head is placed on the skin surface. In a first proof of concept study we applied the electronic nose system to healthy subjects and patients with different degrees of renal failure. The system was able to correctly identify 100 percent of the patients. In further studies we have investigated the applicability of the electronic nose for the non-invasive diagnosis of liver cirrhosis, heart failure and drug detection.

Biography

Prof Andreas Voss is the chair of Biosignal Processing and Medical Informatics at the University of Applied Sciences Jena, Germany. He obtained his degree in Control Theory from the Technical University Dresden, Germany, in 1972 and his PhD in Biomedical Engineering from the German Academy of Sciences in 1990. Andreas is an expert in the non-linear analysis of biomedical signals and his research interests include electrocardiogram analysis for risk stratification in patients with cardiovascular disease and body odor sensors. He has been chief investigator on 15 research project grants from various national and state agencies, including the German Research Council and the German Federal Ministry of Education and Research.

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