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**Continuous Monitoring of Body Fluids
Using Bioimpedance Measurements**

Ein Beitrag aus dem Philips Lehrstuhl für Medizinische Informationstechnik
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Continuous Monitoring of Body Fluids using Bioimpedance Measurements (Abstract)

Bioimpedance Spectroscopy (BIS) allows to determine the human body composition (e.g. fat content, water content). From this data, conclusions can be drawn about the person's state of health. The technology can easily be implemented at a low cost, which could allow continuous monitoring at home (e.g. elderly people) or during clinical treatment (e.g. dialysis patients). The current BIS technology, however, requires laboratory conditions, which can not be fulfilled in a continuous monitoring application. A concept of a system for the continuous monitoring of body fluids, which is based on BIS technology, is presented and evaluated in this thesis. The evaluation does not only include the construction of a BIS portable device, but also the performance of measurements using textile electrodes and the model-based correction of measurements. This specific correction is designed to eliminate external influences, normally compensated by laboratory conditions. Special focus has been given to the influence of changes in body posture and body temperature. In addition, the use of a segmental method of measurement (knee-to-knee) is proposed as an alternative to the whole body (wrist-ankle, or hand-to-foot) measurement. BIS has been measured on patients and healthy subjects in different situations at home and at the clinic. The results show that the model-based correction of measurements may be the key for continuous monitoring using BIS technology and that it could be combined with external sensors connected to the BIS device, in order to eliminate external influences, which all together will allow continuous monitoring with sufficient accuracy.