

4th Global Summit and Expo on

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SensFloor®: Human movement tracking and more

The described sensor floor is a textile-based large-area sensor system, which is installed as an underlay beneath the flooring. It detects people moving across the floor, calculates their trajectories and distinguishes between foot steps and a fall. The use of capacitive proximity sensing instead of pressure sensing gives high flexibility in floor design: even non-elastic flooring, like laminate parquet or tiles are suitable. The installed system is invisible and unobtrusive compared to camera systems. The SensFloor system enables a variety of different applications in the domain of ambient assisted living (AAL) like fall detection, activity monitoring, energy savings, control of automatic doors, intrusion alarm and access control. Presence detection and human movement tracking provide valuable data for Internet of things (IoT) scenarios like i.e. behavioral analysis in retail, workspace, living or healthcare. For example, it allows care organizations to optimize their workflows and improve quality of care. In future, artificial intelligence will provide means to evaluate the health status of people walking on the floor. The proposed processing scheme is able to extract behavioral information from the sensor data, which is fed into a learning algorithm that internally represents typical patterns, and outputs a measure for the divergence of current behavior from typical behavior. Gait pattern analysis by SensFloor provides objective data for medical diagnosis by medical experts like neurologists or physiotherapists. Gait parameters like walking speed, step length, and straightness are important factors for the health status of patients. Regular assessments during the treatment indicate the success of medication and rehabilitation.

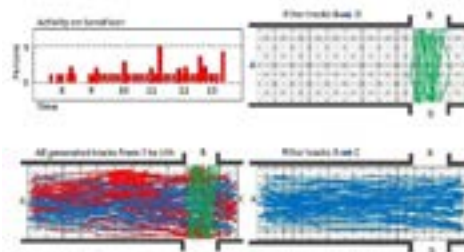


Figure: Human movement tracks on the sensor floor (clockwise: A:activity over time, tracks from B to D, tracks from A to C, all tracks during depicted time)

Recent Publications

1. Hoffmann R, Lauterbach C, Conradt J and Steinhage A (2017) Estimating a person's age from walking over a sensor floor. Computers in Biology and Medicine 95:271-276.
2. Hoffmann R, Lauterbach C and Steinhage A (2017) Learning behavioral routines for early detection of health changes. Ambient Assisted Living ISBN: 978-3-319-52322-4:173-179.
3. Hoffmann R, Lauterbach C, Techmer A, Conradt J and Steinhage A (2016) Recognizing gait patterns of people in risk of falling with a multilayer perceptron. Information Technologies in Medicine 472:87-97.

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Biography

Christl Lauterbach founded the Future-Shape GmbH, and she is Managing Director since 2005. Main product of Future-Shape is SensFloor, a large-area sensor floor. From 1999 until 2005 she was at Infineon Technologies AG, Corporate Research, Senior Staff Engineer for Emerging Technologies, and Project Manager for Smart Textiles. Before that, she worked 22 years at Siemens AG, Corporate Research and Technology, as a developer for Semiconductor Technology and Circuit Design. Education: Assistance Degree in Electrical/Communication Engineering. She has more than 200 patents and patent pending, and >100 scientific publications.

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