

---

# Integrating Physical Activity and Health Aspects in Everyday Mobility

**Maximilian Schrapel**

University of Hannover  
Human-Computer Interaction  
Group  
schrapel@hci.uni-hannover.de

**Anne Finger**

University of Hannover  
Planning and Architecture  
Sociology Section  
a.finger@igt-arch.uni-  
hannover.de

**Jochen Meyer**

OFFIS Institute for Informatics  
Oldenburg, Germany  
meyer@offis.de

**Michael Rohs**

University of Hannover  
Human-Computer Interaction  
Group  
rohs@hci.uni-hannover.de

**Johannes Schöning**

University of Bremen  
Human-Computer Interaction  
Lab  
schoening@uni-bremen.de

**Alexandra Voit**

University of Stuttgart  
Institute of Visualization and  
Interactive Systems  
alexandra.voit@vis.uni-  
stuttgart.de

**Abstract**

Everyday mobility encompasses different forms of public and private transportation. However, everyday mobility often does not involve substantial levels of physical activity. The goal of this workshop is to investigate ways of integrating physical activity into everyday mobility in accordance with widely accepted health recommendations. We aim to explore wearable and ambient systems that sense and support active navigation as well as conceptual aspects from a variety of perspectives, such as persuasive technologies. Researchers from different disciplines are invited to contribute their point of view by means of position papers, posters, and demonstrations. One planned outcome of this workshop is a set of design guidelines for navigation systems that explicitly consider health aspects. The workshop explores requirements and design challenges in a creative setting.

**Author Keywords**

Mobility; navigation; physical activity; health; wearables; mobile interaction; environmental and regional planning.

**ACM Classification Keywords**

H.5.2 [Information interfaces and presentation (e.g., HCI)]: User Interfaces

---

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

Copyright held by the owner/author(s).

*UbiComp/ISWC '18 Adjunct*, October 8–12, 2018, Singapore, Singapore

ACM 978-1-4503-5966-5/18/10.

<https://doi.org/10.1145/3267305.3274135>

## Introduction and Motivation

Navigation for motorists, bicyclists, and pedestrians is a well-researched area in HCI. This includes alternative route selection as well as finding the shortest distance or travel time between two locations. Barrier-free route selection for wheelchair users or elderly people have also been investigated. Up to now there is still a lack of integrating health recommendations into navigation. One of the best known recommendations is the 10,000-steps-a-day rule, which was introduced in 1965 and marketed together with the famous Manpo-Kei pedometer. Many researchers investigated the suitability of this recommendation and found that it reduces the risk of non-communicable diseases.

Nowadays wearables such as smartwatches and wristbands or even simple step counters integrated in smartphones help to track and visualize daily physical activity. Statistics show that physical activity is closely related to health and that unhealthy lifestyles cause a large number of sick days every year. Over 30% of daily car trips have distances of less than 3 km and most of them could be converted into 20 minutes of brisk walking. This suggests a lack of motivation or time to integrate a healthy lifestyle into one's everyday life.

## Workshop Goals

This workshop aims to foster a community of researchers around health aspects of everyday mobility, with an interest in designing ways to facilitate adhering to health recommendations in what we call "Active Mobility." This, e.g., involves tracking physical activities as well as spatial planning, persuasive technologies, simplifying planning and scheduling of active navigation, and exploring ways of increasing the motivation of users. The workshop aims to provide a forum to start a broad and productive discussion on identifying the main requirements of environmental, human, and tech-

nical factors for integrating health recommendations into everyday mobility. As one result we plan to establish design guidelines for navigation systems and future forms of mobility that explicitly take health aspects into account.

## Contributions

This workshop features contributions that address the overall topic from different perspectives. Jaiswal et al. outline an algorithm for continuous activity monitoring on smartwatches. The goal is to find a sweet spot in the tradeoff between recognition performance and energy consumption. Bhattacharya et al. show that by monitoring and perturbing users' daily activity levels, such as increasing daily step counts, multiple sclerosis patients can potentially reduce their fatigue level. Johansen et al. discuss the role of internet-connected hearing aids in activity recognition and preventive healthcare, using environmental soundscape data and motion data. Pandey et al. sketch a framework that manages events from different ubiquitous computing devices and looks for significant event associations in order to provide a pleasurable health guidance experience. Kaul and Rohs discuss requirements of a tactile system to support the mobility needs of visually impaired people.

## Expected Outcomes and Future Directions

The main objective is to formulate guidelines and to develop strategies for everyday mobility that take physical activity into account. The aim is to facilitate the integration of an active and healthy lifestyle into everyday mobility. The agreed-upon design guidelines may serve as a reference for future work of researchers in the area. The guidelines may also support the integration of recommendations into existing systems.