
Integrating Physical Activity and Health Aspects in Everyday Mobility

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Abstract

Everyday mobility encompasses different forms of public and private transportation and different forms of physical activity. However, in general everyday mobility does not involve substantial levels of physical activity. There are sometimes structural reasons or a lack of motivation and time to realize an active lifestyle in the context of mobility. The goal of this workshop is to investigate ways to integrate 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, and thus invite researchers from different disciplines 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. For the full-day workshop we aim to explore requirements and design challenges in a creative setting.

Author Keywords

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

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ACM Classification Keywords

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

Introduction and Motivation

Navigation for motorists, bicyclists, and pedestrians is a well-researched area in HCI. This includes alternative route selection [5] as well as finding the shortest distance or travel time between two locations [4]. Barrier-free route selection for wheelchair users or elderly people have also been investigated [6, 7]. 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 [8]. Many researchers investigated the suitability of this memorable recommendation and found that it reduces the risk of non-communicable diseases [10].

Nowadays wearables such as smartwatches and wristbands or even simple step counters integrated in smartphones help to track and visualize daily physical activity. [9, 2]. Previous research has shown that on average up to 6,000 steps are achieved daily, which is 4,000 steps below the WHO or CDC recommendations [1]. The statistics also show that health is closely related to physical activity and that unhealthy lifestyles cause a large number of sick days every year. In addition, over 30% of daily car trips have distances of less than 3 km and could mostly be converted into 20 minutes of brisk walking [3]. This suggests a lack of motivation or time to integrate a healthy lifestyle into one's everyday life. Recently, Google also attempted to address these challenges by integrating calorie counters in their navigation software, which has not been accepted by users[11].

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 technical 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. Such guidelines can serve as the basis for future work in the area.

Topics

Topics that are relevant to the workshop's overall goal include, but are not limited to:

- Navigation supported by mobile devices and wearables
- Integration of health aspects into passive transportation
- Alternative route selection for pedestrians
- Activity recognition and prediction
- Activities in public transportation
- Motivation for physical activities linked to mobility
- Health aspects for rural areas
- Active lifestyle for people with special needs
- Estimation and use of reliable map information
- Notifications and reminders for health recommendations

- Recognizing and avoiding stress factors in public places and public transportation
- Integration of contextual information into activity and route planning (weather, public events, construction sites)
- Identifying human behaviour and preferences on walked paths
- Design of public places and routes considering health aspects
- Visualizing daily activity

In order to combine the main topics of mobility and physical activity, the workshop will focus on the ubiquitous computing perspective. However, due to the interdisciplinary nature of the workshop contributions from other fields are also welcome.

Workshop Schedule

The full-day workshop will be held in two consecutive sessions. The morning session adheres to a more traditional conference style with an opening and invited talk followed by lightning talks by all participants and discussions of 10 minutes each. This serves to get to know perspectives, identify personal interests, and bring out new emerging issues of common relevance.

After lunch we plan to discuss how the presented approaches can be combined under the main aspects. Further we are going to identify open challenges towards realizing healthy navigation in the relevant areas. In an open discussion we are going to establish strategies and guidelines for navigation systems that explicitly take into account health aspects. We will organize a workshop dinner to have further discussions and suggestions for joint research.

Morning session: Invited talk and lightning talks

09:00 - 09:30	<i>Workshop introduction and overview</i>
09:00 - 09:30	<i>Talk (A.Finger): Health aspects in spatial planning</i>
10:00 - 10:30	<i>Invited talk</i>
10:30 - 11:00	<i>Coffee break</i>
11:00 - 12:30	<i>Lightning talks from all participants</i>

Afternoon session: Establishing guidelines and strategies

14:00 - 14:15	<i>Formation of groups for sub-topics</i>
14:15 - 15:30	<i>Group work: Identification of challenges and requirements</i>
15:30 - 16:00	<i>Coffee break</i>
16:00 - 16:45	<i>Group presentations</i>
16:45 - 17:00	<i>Prioritization of identified challenges</i>
17:00 - 18:00	<i>Development of design guidelines and strategies</i>
19:00 - open end	<i>Workshop dinner</i>

Table 1: Proposed workshop schedule

Organization

In order to ensure a broad perspective on the workshop topics the workshop is organized by researchers with diverse backgrounds.

Maximilian Schrapel is a Ph.D student in human-computer interaction at the University of Hannover, Germany. He holds a Bachelors degree in electrical engineering and a Masters Degree in computer science. His research focus lies on novel interaction techniques and tracking devices with pattern recognition. This involves health aspects and monitoring of daily activities with sensor fusion.

Anne Finger is a PhD research fellow in spatial planning at the University of Hannover. She holds a Bachelors Degree in landscape architecture and environmental planning and a Masters Degree in environmental planning. Currently she is investigating on innovative supply concepts for rural areas

and sustainable human mobility including health aspects in future mobility concepts.

Jochen Meyer is Director of the R&D Division Health at the OFFIS Institute for Information Technology. He holds a diploma in Computer Science from the University of Oldenburg. His research interests are in the field HCI and technology healthy living and prevention, ambient assisted living.

Michael Rohs is a professor of human-computer interaction at the University of Hannover. His work focuses on novel interaction techniques for mobile devices and mobile haptic feedback. He holds a Ph.D. in computer science from ETH Zurich, Switzerland, was as a senior research scientist at Deutsche Telekom Laboratories and TU Berlin, and an assistant professor at the University of Munich.

Johannes Schöning is a Lichtenberg Professor and professor of human-computer interaction (HCI) at the University of Bremen in Germany. In addition, he is the co-director of the Bremen Spatial Cognition Center (BSCC). His research interests lie at the intersection between HCI, geographic information science, and ubiquitous interface technologies.

Alexandra Voit is a Ph.D. student at the socio-cognitive systems group at the University of Stuttgart. She holds a Diploma in Software Engineering. Her current research focuses attention management in the era of the Internet of Things and the smart home, especially using ambient notifications and persuasive technologies.

Participation

Workshop candidates are invited to submit a position paper of up to four pages using the SIGCHI Extended Abstracts Format. The contribution should address any relevant topic and be submitted in PDF format by July 10th,

2018 via EasyChair. The position papers will be reviewed by the workshop committee and external reviewers. The workshop is designed for 10 to 15 participants. Ph.D. students are also invited to submit to get early feedback on their interests and planned research. Upon acceptance, contributors are asked to prepare a poster or demonstration, if applicable, for the workshop. The extended abstracts will be made available on the workshop website together with the explored guidelines.

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. The position papers of the participants as well as the formulated guidelines will be published on the workshop website and in the ACM Digital Library. The organizers will actively advertise the workshop via email lists and social media platforms.

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Call for Papers

Workshop on Integrating Physical Activity and Health Aspects in Everyday Mobility at Ubicomp 2018.

Motivation

Everyday mobility encompasses different forms of public and private transportation and different forms of physical activity. However, in general everyday mobility does not involve substantial levels of physical activity. There are sometimes structural reasons or a lack of motivation and time to realize an active lifestyle in the context of mobility. The goal of this workshop is to investigate ways to integrate 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, and thus invite researchers from different disciplines 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. For the full-day workshop we aim to explore requirements and design challenges in a creative setting.

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- Visualizing daily activity

We invite researchers to submit a position paper of up to four pages using the SIGCHI Extended Abstracts Format by July 10. The contribution should address any relevant topic and be submitted in PDF format via EasyChair. The position papers will be reviewed by the workshop committee and external reviewers. Upon acceptance and notification on August 7, the extended abstracts will be made available on the workshop website together with the explored guidelines after the workshop day on October 8. In addition, we plan to include all accepted contributions in the ACM Digital Library.

Goals

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.