UPA'18: 3rd International Workshop on Ubiquitous Personal Assistance

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Abstract

Advancements in ubiquitous technologies and artificial intelligence have paved the way for the recent rise of digital personal assistants in everyday life. The *Third International Workshop on Ubiquitous Personal Assistance* (UPA'18) aims to build on the success of our both previous workshops (namely *SmartGuidance*), organized in conjunction with UbiComp'16/17, to continue discussing the latest research outcomes of digital personal assistants. We invite the submission of papers within this emerging, interdisciplinary research field of *ubiquitous personal assistance* that focuses on understanding, design, and development of such digital helpers. We also welcome contributions that investigate human behaviors, underlying recognition, and prediction models; conduct field studies; as well as propose novel HCI techniques to provide personal assistance. All workshop contributions will be published in the supplemental proceedings of the UbiComp'18 conference and included in the ACM Digital Library.

Author Keywords

digital personal assistants; anticipatory mobile computing; proactive support; personalization; ubiquitous devices

ACM Classification Keywords

H.4.0 [Information Systems Applications]: General; J.4 [Social and Behavioral Sciences]
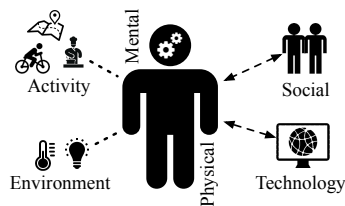
Figure 1: Six common areas of personal or human-centric assistance

Introduction

In 1991, Weiser had the vision of ubiquitous computing where interconnected pervasive technologies *unobtrusively* support humans in daily life [7]. To this day, more than 25 years later, his vision has not come to fruition.

Indeed, a major step forward in pervasive technology is being carried out with modern ubiquitous devices, such as smartphones or Internet-of-Things (IoT), which are able to sense and change the user's environment [3]. In combination with Artificial Intelligence (AI), early visions of digital Personal Assistants (PAs) become almost reality (so-called IPAs, e.g., Apple's Siri, Google Assistant, or Amazon's Alexa). However, digital personal assistants are still in their infancy and far from being able to support humans *unobtrusively* or based on user's intents in everyday life, or the way human personal assistants are able to.

Ubiquitous personal assistance (UPA) refers to the next era of digital personal assistants; refining and completing the concept of IPA by (i) advanced personalization (i.a., detection of user's intents [6]), (ii) proactive or even autonomous support [4], (iii) being a single point of ubiquitous assistance [1], (iv) the collaboration and coordination between different assistants or assistance use cases and several devices, as well as (v) the unobtrusive integration of the user in the loop to adjust underlying models (e.g., [5, 2]).

Workshop Objectives

The goal of the workshop is to provide a structured space where people can discuss digital personal assistants in the different areas of human-centric assistance (cf. Fig. 1), its challenges, and the latest research outcomes. We also want to discuss how such digital helpers can unobtrusively guide and intent-based support users in their daily and professional life. Moreover, we pursue finding novel ways to

exploit current prediction models and HCI techniques to provide intelligent personal support or interventions, and encourage researchers to think more in that direction.

We believe that *ubiquitous personal assistance* is one of the emerging research fields after mobile sensing, context recognition and prediction. Thus, the workshop topic is timely and highly relevant for the ubiquitous computing community and hopefully acts as inspiration for the community. This workshop strongly targets to promote this research field and should be part of this year's *UbiComp'18*.

Workshop Plan

In the 1-day workshop, we will bring people from academia and industry together who are active within areas like digital personal assistance, context recognition and prediction, psychological and persuasive computing, or human-computer-interaction (HCI). Through a planned invited open keynote presentation, participant's presentations of accepted papers, and discussions we target to state (a) the recent challenges in this research field, and (b)promising ways for further research to address and overcome them.

We do not mainly intend to invite standard research papers with novel findings, but also papers that describe design, development, challenges or limitations of their works. The objectives of these papers are to support, inspire and encourage researchers in the field of UPA. For the peer-review process, we invite well-chosen experts in the fields of the interdisciplinary workshop topic. Therefore, all accepted papers should be part of the adjunct proceeding and ACM Digital Library. These papers will also be referenced or published on the workshop website (http://upa18.weebly.com).

The workshop will be held at UbiComp for the third time and will be open for all UbiComp participants. We target to accept at least 10 submissions and attract 20+ participants.
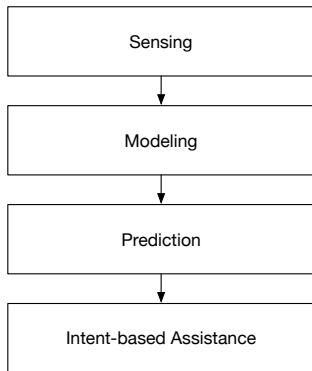
Figure 2: Key processing stages of digital personal assistants

Topics of Interest

Through the interdisciplinary nature of *ubiquitous personal assistance* and the required processing stages (cf. Fig. 2; analogous to [3]), the workshop invites a wide range of submissions, which study the workshop topic from various perspectives. We also welcome researches from diverse disciplines including data scientists, developers, and HCI experts. Further, we appreciate any submissions that suggest and investigate design solutions, methods, concepts or development practices how to proactively support users and trigger human behavior changes in unobtrusive ways. Overall, we accept submissions, ranging from motivated opinions or viewpoints on UPA, over work-in-progress or short technical papers, to full research papers.

The following list gives an overview of relevant key topics for the workshop:

- Digital personal assistants, anticipatory mobile computing, interpretation of predictive model outcomes, decision making, and intent-based assistance

- Understanding human behavior including mobile sensing, context recognition and prediction

- Human behavior changes, intervention mechanisms, proactive guidance, intelligent actioning, psychological and persuasive computing

- Novel HCI interfaces and techniques to provide personal support

- Infrastructures, platforms, frameworks, and design for the development of digital personal assistants

Organizers

The workshop organizers are all active researchers in the fields of ubiquitous computing, data science, or HCI.

Christian Meurisch is a researcher at TU Darmstadt (Germany). He researches in a framework for ubiquitous personal assistance, which covers his PhD topic and a special awarded project. He acted as reviewer for several conferences/journals (recently, MobileHCI'18, ISWC'17, ToN), and chaired both previous workshops at UbiComp16/17.

Philipp M. Scholl is a senior researcher at the University of Freiburg, lecturing in wearable computing. His research is about memory augmentation and guidance systems for manual work, and health-related behavior change using wearable and ubiquitous computing components.

Usman Naeem is a senior researcher/lecturer at the University of East London (UK), receiving his PhD in 2009. His research focuses on assistive technologies to support independent living for the elderly, which includes ML techniques, mobile computing, and ambient intelligent environments.

Veljko Pejović is an assistant professor at the University of Ljubljana (Slovenia). His research focuses on mobile sensing, anticipatory mobile computing, and the analysis of mobile data traces. He has served as reviewer for several journals/conferences (i.a., CSUR, IMWUT, CHI, MobiCom).

Florian Müller is a HCI researcher at TU Darmstadt (Germany). His research focuses on exploring and studying novel ways of interaction with Head Mounted Displays and body-based interfaces in smart spaces. In recent years, he chaired several workshops (e.g., *SmartObjects* at CHI'18).

Elena Di Lascio is a PhD student at Universitá della Svizzera italiana (Lugano, CH), where she is advised by Prof. Silvia Santini. She focuses on the design, development and evaluation of emotion-aware mobile systems for promoting human well-being. She worked as local arrangement chair for the 6th D-A-CH+ Conference on Energy Informatics.

Sebastian Kauschke is a data scientist and lecturer of a machine learning course at TU Darmstadt (Germany). His research focuses on predictive models and model adaptations for evolving systems.

Pei-Yi (Patricia) Kuo is a postdoctoral research fellow at UMSI (USA). Her research focuses on studying/developing digital health interventions and behavior intervention technologies to encourage multiple behavioral changes in domains of well-being. She has served as reviewer/pc member for several HCI conferences (i.a., TAICHI, UIST, TEI).

Muhammad Awais Azam is an assistant professor at UET Taxila (Pakistan), receiving his PhD in 2012. He researches and leads a research team in the area of pervasive computing including network architecture, ambient intelligence, wireless communications, and recommender systems.

Max Mühlhäuser is a full professor in ubiquitous computing and HCI, and head of the Telecooperation Lab (TU Darmstadt, Germany) since 2000. He has (co-)chaired several workshops (recently, *SmartObjects* at CHI'18), and has served as a reviewer or program committee member for several journals or conferences in HCI and ubiquitous computing (recently, PerCom'18 and UbiComp'18 / IMWUT).

Expected Outcomes

Since *ubiquitous personal assistance* is (i) the next era of digital personal assistants, and (ii) one of the emerging research fields in ubiquitous computing after mobile sensing, context recognition and prediction, we plan to further promote this field through the proposed workshop. We will also illustrate novel concepts, and principles; and state recent challenges, and limitations of personal (proactive) support, intervention mechanisms, and human behavior changes.

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