WAHM 2016: 3rd Workshop on Ubiquitous Technologies for Augmenting the Human Mind

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Abstract
In recent years there has been a growing interest in augmenting human cognition (attention, engagement, memory, learning, etc.) through ubiquitous technologies. With the ongoing research and development of near-constant capture devices, unlimited storage, and algorithms for retrieval, the resulting personal data has opened the door to a vast range of applications. In the third rendition of this workshop series, we focus on technologies and applications of capturing and integrating personal memory into everyday use cases. With the question *What constitutes as a modern lifelog?*, we would like to invite researchers, designers, and practitioners to envision and exchange ideas on how ubiquitous technologies and applications enhance people's memory in everyday life. In this one-day workshop, we will formulate application scenarios for making use of ubiquitous technologies in order to push personal data to an application layer where it is used to support and augment the human mind.

Author Keywords
human memory; lifelogging; memory aids; cognitive systems; quantified mind; recall;

ACM Classification Keywords
H.5.m. [Information Interfaces and Presentation (e.g. HCI)]: Miscellaneous

Introduction

Human memory holds a lifetime worth of information, which forms the base of our knowledge, our character, and identity. At times this memory fails us, which is why people have always sought to develop tools to make sure information is not lost: through the advent of writing all the way to the printing press and the invention of computers. Such tools help us retain information, browse through them, and ultimately remember. Nowadays, a vast array of commercially available technologies enable us to record extensive amounts of data of our lives. This personal data contains activities, locations, experiences, and therefore memories. Advances in machine learning have made it feasible to turn this data into memories that can be processed, queried, and retrieved. Hence, Vannevar Bush's Memex vision [1] of an external memory extension has become reality through near-constant recording capabilities, vast storage space and a ubiquitous Internet connection. In theory, people have their entire set of experiences and knowledge at their fingertips. But the challenge persists: delivering information at the right time to the right extent in a context-driven way.

For this workshop, we are looking for visions and application scenarios that utilize lifelogs for augmenting human memory. In its third rendition, we are building on an existing community ([2], [3]). It started originally with 15 participants and grew to 34 in last year's workshop. With the question *What constitutes as a modern lifelog?*, we want to challenge the community this time to lay its focus on lifelogs as an extension of existing resources, which people will query in the future when they are looking for information. Rather than using an online search engine or manually looking through terabytes of personal data, people may simply ask an assisting system: "What was the name of that tapas place I enjoyed in Barcelona a few years ago?". Searches may no longer take place purely in online archives, but also draw from personal experiences and memories. We would like to invite researchers, designers, and practitioners to envision and exchange ideas on how ubiquitous technologies and applications enhance people's memory in everyday life. At the intersection of technology and cognitive psychology, we concentrate on the integration of lifelogs in application layers, the utilization of e-memories and new forms of memory aids.

Themes

Based on submissions and discussions from these last years, we have identified the following challenges:

Applied cognitive memory theories: how can lifelogs and ubiquitous technologies be used to re-enforce (or even attenuate) memories? Technology can be used to retrieve items from lifelogs and help remedy memory loss by providing users with time-relevant and context-appropriate cues.

Harvesting existing data sources: an increasing number of commercial products are available for quantifying people's lives. Although the adoption of additional recording devices has been slow, people have increasingly engaged in recording and sharing their daily habits and experiences on social media. How much of this data can be used for personal lifelogs or implicitly collected in order to support memory? What retrieval and processing practices can be used to support application layers?

Attention awareness: a holistic lifelog allows algorithms to derive user patterns, such as favorite foods, preferred outdoor activities, authors read, countries travelled, but also detailed information about how users spend their days. How can this information be used by systems to recommend tasks throughout the day, schedule notifications and interruptions, or decide how densely information can be presented?

Designing knowledge acquisition points: whenever people consume information or make new experiences, they advance their personal knowledge: whether that is consciously focusing on digesting information, such as when reading, or learning something during a conversation. How can the user interface be adjusted at the time of engagement so that information can be linked to existing memories or experiences?

Privacy and security: personal recording technologies, culmination of information in lifelogs, and providing access to such raise new challenges to people's security of personal data. When private memory records are stored for later retrieval, they need to be protected from unauthorized access and tinkering. This goes along with the need to develop flexible paradigms for how to share e-memories.

Commercial application areas for e-memories: while many of the application domains for memory technologies are targeting the public good, the same technologies can also be employed in a commercial context. For example, drawing information from lifelogs could be used to support a new form of advertising, in which products are linked to past experiences.

Goals and Activities

The goal of this workshop is to develop and share visions and concrete application scenarios using ubiquitous technologies to exploit personal data in supporting and augmenting the human mind. The above-mentioned themes will be used as a starting point for in-depth discussions and group analyses. We will also pay attention to new themes possibly emerging from morning presentation and discussions.

The one-day workshop is started off with a brief introduction followed by the keynote delivered by Dr. Lewis Chuang from the Max Planck Institute for Biological Cybernetics. Thereafter, participants and authors of position papers are given the opportunity to present their ideas and research based on which concrete application scenarios will be developed. A final group challenge will trigger discussions on fundamental visions of lifelogging and its applications for memory in the afternoon. The workshop will be documented in detail including the process and outcome of each discussion, all of which will be made publicly available on the workshop's website.

We anticipate up to 40 participants at the workshop (including the workshop's organizers and committee), of which we expect a subset to submit position papers (of 4 to max. 6 pages length in ACM SIGCHI Extended Abstracts format) in advance. Papers should describe their author's work, challenges and opportunities they see for actionable lifelogs and technologies that augment human memory. We put together a program committee comprising the workshop organizers as well as further external experts who will select participants' submissions in a single-blind review process according to the relevance of their work, interests and familiarity with the WAHM workshop topics.

Organizers

Tilman Dingler is a researcher at the Institute for Visualization and Interactive Systems at the University of Stuttgart focusing at cognition-aware systems with hindsight to memory augmentation.

Kai Kunze is an associate project professor at Keio Media Design, Keio University contributing to the field of pervasive computing with a focus on sensing, physical and cognitive activity recognition.

Evangelos Niforatos is a researcher at Università della Svizzera italiana (USI) in Lugano, Switzerland. His main

research interests lie in the area of Ubiquitous Computing, where he develops methods and tools for supporting episodic memory recall.

Cathal Gurrin is a lecturer at the School of Computing, at Dublin City University, Ireland and is a principal investigator at the Insight Centre for Data Analytics. His research interest is personal data analytics, information retrieval and lifelogging.

Ioannis Giannopoulos is a post-doctoral researcher and lecturer at the Chair of Geoinformation Engineering at the Swiss Federal Institute of Technology (ETH) Zurich. His research interests focus on mobile gaze based assistance of spatio-temporal decisions during wayfinding.

Andreas Dengel is a member of the Management Board and Scientific Director at the German Research Center for Artificial Intelligence (DFKI) in Kaiserslautern and leader of the Knowledge Management Research Department. His research interests lie in the areas of Smart Data, Deep Learning and Document Understanding.

Koichi Kise is a Professor at the Department of Computer Science and Intelligent Systems and is the director of the Institute of Document Analysis and Knowledge Science (IDAKS) at Osaka Prefecture University, Japan. His research interests includes documents retrieval, images and human activities specializing on reading.

Call for Papers

With the growing interest in and commercialization of lifelog devices, applications, and augmentation of human cognition, the third rendition of this workshop series focuses on technologies and applications of capturing and integrating personal memory into everyday use cases. With the question *What constitutes as a modern lifelog?*, we would like to invite researchers, designers, and practitioners to envision and exchange ideas on how ubiquitous technologies and applications enhance people's memory in everyday life. In this one-day workshop taking place on 12th of September 2016, we will formulate application scenarios for making use of ubiquitous technologies in order to push personal data to an application layer where it is used to support and augment the human mind. A program committee consisting of experts in the field will select participants' position papers based on their conducted and envisioned work, challenges and opportunities they see for actionable lifelogs and technologies that augment human memory.

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