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Computing Machinery

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NEWS RELEASE

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PHENOMENAL GROWTH AND FUTURE DIRECTIONS OF PervasivE COMPUTING HIGHLIGHTED AT UBICOMP 2019

Three-Day Event Includes International Symposium on Wearable Computers

New York, NY, August 28, 2019 – ACM, the Association for Computing Machinery, will hold the annual [ACM International Joint Conference on Pervasive and Ubiquitous Computing \(UbiComp 2019\)](#) from September 11-13 in London, UK. UbiComp is the premier venue for presenting research in the design, development, and deployment of ubiquitous computing systems. Researchers and practitioners will explore the latest innovations across a broad range of technologies, from mobile phones to sensors and the Internet of Things to wearable computers and futuristic new technologies. The conference also presents the latest research on the human experiences and social impacts that these pervasive technologies facilitate.

Hallmarks of ubiquitous and pervasive computing include mobile computers, such as smartphones, as well as everyday objects, such as refrigerators, all connected to the Internet via wireless technologies—enabling everywhere/all the time computing. Mark Weiser, a pioneering researcher at Xerox PARC, is credited with coining the phrase “ubiquitous computing” in 1988, which he described as “invisible: its highest ideal is to make a computer so imbedded, so fitting, so natural, that we use it without even thinking about it.”

UbiComp 2019 will be collocated with the [International Symposium on Wearable Computers \(ISWC\)](#). ISWC is the premier forum for research on wearable technology and topics related to on-body and worn mobile technologies. Contributions from a wide range of domains (including fashion design, computer science, textile engineering, optics, and sociology, among others) are featured.

“Ubiquitous computing has skyrocketed in the last fifteen years and is now a dominant paradigm,” said Robert Harle of Cambridge University, General Co-chair of UbiComp 2019. “At the same time, our world of always-connected and everywhere-accessible computing is still in its infancy. The annual UbiComp conference is the most comprehensive venue for research on all aspects of this emerging field. For example, the papers program of this year’s conference is divided into 36-distinct sessions, with session titles including everything from Smartphones & Apps to Mobile Health, to Vehicle and Data Management. The program of workshops and tutorials also reflect the wide range of research that is being done in our field. As in past years, we’ve organized UbiComp to provide attendees with an opportunity to connect with colleagues around the world and learn about the latest innovations that are shaping our field.”

2019 ACM UBICOMP HIGHLIGHTS

Keynote Speakers

“Machine Learning Models for Ubiquitous Systems with Safety and Reliability Guarantees”

Marta Kwiatkowska, University of Oxford

Computing devices support us in almost all our everyday tasks, from smartphones and wearable devices, to self-driving cars and robots. Driven by applications in health and behavioral monitoring, as well as affective computing, there is a growing demand for computational models that can accurately predict multimodal features from a multitude of sensor data. This lecture will give an overview of modelling and personalization techniques and their role in a variety of applications, including medical devices, biometric security, cobotics and self-driving cars.

“Liberating Technologies to Venture into the Real World”

Lama Nachman, Intel

Nachman is an Intel Fellow and directs Intel’s Anticipatory Computing Lab. Her research is focused on creating contextually aware experiences that understand users through sensing and sense making and act on that context to help with many aspects of their lives.

Research Papers (Partial List)

For the full list of papers, visit [here](#).

“Detachable Smartwatch: More than a Wearable”

Kent Lyons, Toyota Research Institute; Rushil Khurana, and Mayank Goel, Carnegie Mellon University
Glanceability and low access time are arguably the key assets of a smartwatch. However, smartwatches are currently limited to micro-interactions. They do not enable complex interactions and, in general, they do not afford continuous use for long. The authors believe that smartwatches can retain micro-interactions and glanceability, but also get better at long and complex interactions. We propose a smartwatch that a user can detach and use as more than a wearable depending on their context, requirements, and preference. Detaching the watch enables it to morph into different forms, and thereby become a better interaction device, better display, and a better sensor suite.

“Mobile Money: Understanding and Predicting its Adoption and Use in a Developing Economy”

Simone Centellegher, Fondazione Bruno Kessler, University of Trento, Vodafone Research; Bruno Lepri, Fondazione Bruno Kessler; Giovanna Miritello, Daniel Villatoro, Devyani Parameshwar, and Nuria Oliver, Vodafone

Access to financial institutions is difficult in developing economies and especially for the poor. However, the widespread adoption of mobile phones has enabled the development of mobile money systems that deliver financial services through the mobile phone network. Despite the success of mobile money, there is a lack of quantitative studies that unveil which factors contribute to the adoption and sustained usage of such services. In this paper, the authors describe the results of a quantitative study that analyzes data from the world’s leading mobile money service, M-Pesa. They analyzed millions of anonymized mobile phone communications and M-Pesa transactions in an African country.

“Understanding Parents’ Perspectives on Mealtime Technology”

Ying-Yu Chen, Ziyue Li, Daniela Rosner, University of Washington, Seattle, WA; Alexis Hiniker, The Information School, Mary Gates Hall, Seattle, Washington

For young children, family meals are an enjoyable and developmentally useful part of daily life. Although prior work has shown that ubiquitous computing solutions can enhance children's eating habits and mealtime experiences in valuable ways, other work demonstrates that many families are hesitant to use technology in this context. This paper examines adoption barriers for technology for family meals to understand with more nuance what parents value and resist in this space.

“Detecting Door Events Using a Smartphone via Active Sound Sensing”

Thilina Dissanayake, Takuya Maekawa, Daichi Amagata, and Takahiro Hara, Osaka University

Event detection of indoor objects, including doors, has a wide variety of applications, including intruder detection, HVAC control, and surveillance of independently living elderly people. Hence, this has been the focus of multiple research projects in the UbiComp research community. In this paper, the authors propose a method to accurately detect door events in an indoor environment, without the installation and maintenance costs of using distributed ubiquitous sensors. Their method recognizes the events of multiple doors existing in the environment via active sound probing using a disused smartphone installed in the environment.

“The Connected Shower: Studying Intimate Data in Everyday Life”

Hyosun Kwon, Joel E. Fischer, Martin Flintham, and James Colley, University of Nottingham

This paper presents the design and field study of the Connected Shower, a bespoke IoT device that captures water flow, temperature, shower-head movement, and shower product weight. The authors deployed the device in six UK homes for a week to understand the use of “intimate data” as captured by IoT systems. Findings from their contextual interviews unpack how such intimate data is collaboratively made sense of by accounting for the social order of showering practices as part and parcel of everyday routines; how the data makes details of showering accountable to their partners; and how people reason about sharing intimate data both with third parties and their partners.

“PocketCare: Tracking the Flu with Mobile Phones Using Partial Observations of Proximity and Symptoms”

Wen Dong, Tong Guan, Chunming Qiao, University of Buffalo; and Bruno Lepri, Fondazione Bruno Kessler

The authors track the spreading of flu in the spatial-proximity network of a 3000-people university campus by mobilizing 300 volunteers from this population to monitor nearby mobile phones through Bluetooth scanning and to daily report flu symptoms about and around them. Their results show that they can predict flu infection two weeks ahead of time with an average precision from 0.24 to 0.35 depending on the amount of information. This precision is six to nine times higher than with a random guess model.

Workshops (Full List)

- EarComp 2019: 1st International Workshop on Earable Computing
- SCAH 2019: Addressing Grand Challenges in Healthcare through Smart Clothing
- AppLens 2019: 2nd Workshop on Mining and Learning from Smartphone Apps for Users
- Beyond Individuals: Exploring Social Experience Around Wearables
- Continual and Multimodal Learning for Internet of Things

- CPD 2019: 2nd Workshop on Combining Physical and Data-Driven Knowledge In Ubiquitous Computing
- EyeWear 2019: Third Workshop on EyeWear Computing
- HASCA 2019: 7th International Workshop on Human Activity Sensing Corpus and Applications
- LDC 2019: Workshop on Longitudinal Mobile, Wearable and Ubiquitous Data Collection from Human Subject Studies
- Mental Health and Well-being: Sensing and Intervention
- PURBA 2019: 8th Workshop on Pervasive Urban Applications
- UPA'19: 4th International Workshop on Ubiquitous Personal Assistance
- UBITTENTION 2019: 4th International Workshop on Smart & Ambient Notification and Attention Management
- The Uncomfortable Workshop: Exploring Discomfort Design for Wellbeing and Sustainability
- WellComp'19: 2nd International Workshop on Computing for Well-being

About UbiComp

The [ACM International Joint Conference on Pervasive and Ubiquitous Computing \(UbiComp\)](#) is a premier venue for presenting research in the design, development, deployment, evaluation and understanding of ubiquitous computing systems, including pervasive, wireless, embedded, wearable and mobile technologies, to bridge the gaps between the digital and physical worlds. Ubicomp brings together top researchers and practitioners who are interested in both the technical and applied aspects of ubiquitous computing. UbiComp is sponsored by the ACM Special Interest Group on Mobility of Systems, Users, Data and Computing (SIGMOBILE) and the ACM Special Interest Group on Computer-Human Interaction (SIGCHI).

About ACM

[ACM, the Association for Computing Machinery](#), is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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