2015 IEEE International Conference on Pervasive Computing and Communications

(PerCom 2015)

St. Louis, Missouri, USA 23-27 March 2015



IEEE Catalog Number: CFP15PCO-POD **ISBN:**

978-1-4799-8034-5

Keynote Talk 1

Socially Assistive Robotics: Personalized Machines that (Provide) Care Maja Mataric (University of Southern California, USA)

Session 1: Sensor Data Mining

Mining relations and physical grouping of building-embedded sensors and actuators Luis I Lopera Gonzalez and Oliver Amft (University of Passau, Germany) pp. 2-10

Placer++: Semantic Place Labels Beyond the Visit John C. Krumm, Dany Rouhana and Ming-Wei Chang (Microsoft Research, USA) pp. 11-19

Fault Detection for Binary Sensors in Smart Home Environments

Juan Ye and Graeme Stevenson (University of St Andrews, United Kingdom); Simon Dobson (University of St. Andrews, United Kingdom) pp. 20-28

Online Unsupervised State Recognition in Sensor Data

Julien Eberle, Tri Kurniawan Wijaya and Karl Aberer (EPFL, Switzerland) pp. 29-36

Session 2: Energy Analytics

Energy Modeling of System Settings: A Crowdsourced Approach

Ella Peltonen and Eemil Lagerspetz (University of Helsinki, Finland); Petteri Nurmi (Helsinki Institute for Information Technology HIIT, Finland); Sasu Tarkoma (University of Helsinki, Finland) pp. 37-45

DOSE: Detecting User-Driven Operating States of Electronic Devices from a Single Sensing Point

Ke-Yu Chen and Sidhant Gupta (University of Washington, USA); Eric Larson (Southern Methodist University, USA); Shwetak N. Patel (University of Washington, USA) pp. 46-54

CrowdTasker: Maximizing Coverage Quality in Piggyback Crowdsensing under Budget Constraint

Haoyi Xiong (Institut Mines Télécom, SudParis, France); Daqing Zhang (Institut Télécom, Télécom SudParis, France); Guanling Chen (University of Massachusetts Lowell, USA); Leye Wang (Institut Mines Télécom, SudParis, France); Vincent Gauthier (Institut TELECOM; Telecom SudParis; SAMOVAR UMR, France)

pp. 55-62

Acoustic Based Appliance State Identifications for Fine Grained Energy Analytics

Nilavra Pathak (University of Maryland Baltimore County, USA); Md Abdullah Al Hafiz Khan (University of Maryland, Baltimore County, USA); Nirmalya Roy (University of Maryland Baltimore County, USA) pp. 63-70

Session 3: Activity Sensing

Joint Segmentation and Activity Discovery using Semantic and Temporal Priors

Julia Seiter (Wearable Computing Lab ETH Zurich, Switzerland); Wei-Chen Chiu and Mario Fritz (Max Planck Institute for Informatics, Saarbrücken, Germany); Oliver Amft (University of Passau, Germany); Gerhard Tröster (Wearable Computing Lab ETH Zürich, Switzerland) pp. 71-78

Pervasive Self-powered Human Activity Recognition without the Accelerometer Sara Khalifa, Mahbub Hassan and Aruna Seneviratne (University of New South Wales, Australia) pp. 79-86

Using Infrastructure-provided Context Filters for Efficient Fine-grained Activity Sensing Vigneshwaran Subbaraju, Sougata Sen and Archan Misra (Singapore Management University, Singapore); Satyadip Chakraborti (IIT Kharagpur, Singapore); Rajesh K Balan (Singapore Management University, Singapore) pp. 87-94

Keynote Talk 2

Watson and the Era of Cognitive Computing Guruduth S Banavar (IBM Research, India) pg. 95

Session 4: Mobile Assistance

Attelia: Reducing User's Cognitive Load due to Interruptive Notifications on Smart Phones Tadashi Okoshi (Keio University, Japan); Julian Ramos Rojas (Carnegie Mellon University, USA); Hiroki Nozaki and Jin Nakazawa (Keio University, Japan); Anind Dey (Carnegie Mellon University, USA); Hideyuki Tokuda (Keio University, Japan) pp. 96-104

We Help You Watch Your Steps: An Unobtrusive Alertness System for Pedestrian Mobile Phone Users

Jiaqi Wen (The Hong Kong Polytechnic University, Hong Kong); Jiannong Cao (Hong Kong Polytechnic Univ, Hong Kong); Xuefeng Liu (The Hong Kong Polytechnic University, Hong Kong) pp. 105-113

When to Type, Talk, or Swype: Characterizing Energy Consumption of Mobile Input Modalities Fangzhou Jiang (NICTA, Australia); Eisa Zarepour, Mahbub Hassan and Aruna Seneviratne (University of New South Wales, Australia); Prasant Mohapatra (University of California, Davis, USA) pp. 114-122

Beyond Location Check-ins: Exploring Physical and Soft Sensing to Augment Social Check-in Apps

Kiran K. Rachuri (Samsung Research America, USA); Theus Hossmann (ETH Zurich, Switzerland); Cecilia Mascolo and Sean Holden (University of Cambridge, United Kingdom) pp. 123-130

Session 5: Pervasive Health

WiBreathe: Estimating Respiration Rate Using Wireless Signals in Natural Settings in the Home Ruth Ravichandran, Elliot Saba, Ke-Yu Chen, Mayank Goel, Sidhant Gupta and Shwetak N. Patel (University of Washington, USA) pp. 131-139

Multiple Model Recognition for Near-Realistic Exergaming

Bobak Jack Mortazavi (Yale University & Center for Outcomes Research and Evaluation, USA); Mohammad Pourhomayoun, Suneil Nyamathi and Brandon Wu (UCLA, USA); Sunghoon Ivan Lee (Harvard Medical School, USA); Majid Sarrafzadeh (UCLA, USA) pp. 140-148

Fine-grained Recognition of Abnormal Behaviors for Early Detection of Mild Cognitive Impairment

Daniele Riboni, Claudio Bettini, Gabriele Civitarese and Zaffar Haider Janjua (University of Milan, Italy); Rim Helaoui (Philips Research, The Netherlands) pp. 149-154

Smart Table Surface: A Novel Approach to Pervasive Dining Monitoring

Bo Zhou, Jingyuan Cheng and Mathias Sundholm (German Research Center for Artificial Intelligence, Germany); Attila Reiss (University of Passau, Germany); Wuhuang Huang (German Research Center for Artificial Intelligence, Germany); Oliver Amft (University of Passau, Germany); Paul Lukowicz (DFKI and University of Kaiserslautern, Germany) pp. 155-162

Session 6: Pervasive Transportation

LaneQuest: An Accurate and Energy-Efficient Lane Detection System

Heba Aly (Alexandria University, Egypt); Anas Basalamah (University of Minnesota & Umm Al-Qura University, USA); Moustafa Youssef (Egypt-Japan University of Science and Technology (EJUST), Egypt) pp. 163-171

FINE: Frequency-divided Instantaneous Neighbors Estimation System in Vehicular Networks

Linghe Kong (McGill University & Shanghai Jiao Tong University, Canada); Xi Chen (McGill University, Canada); Xue Liu (McGill University, Canada); Lei Rao (General Motors Research Lab, USA)

pp. 172-177

DoppelDriver: Counterfactual Actual Travel Times for Alternative Routes

Daehan Kwak, Daeyoung Kim, Ruilin Liu, Badri Nath and Liviu Iftode (Rutgers University, USA) pp. 178-185

Keynote Talk 3

An Expanding and Expansive View of Computing, and the Special Role of Pervasive Computing Jim Kurose (University of Massachusetts at Amherst, USA) pg. 186

Panel Session

Cyber-Physical Systems and Pervasive Computing: Overlap or Divergent?

David Corman (National Science Foundation, USA); Christine Julien (University of Texas at Austin, USA); Lui Sha (University of Illinois at Urbana-Champaign, USA); Franco Zambonelli (University of Modena and Reggio Emilia, Italy)

pp. 187-188

Session 7: Sensing and Applications

Sensor Use and Usefulness: Trade-Offs for Data-Driven Authentication on Mobile Devices Nicholas Micallef (Glasgow Caledonian University, United Kingdom); Hilmi Gunes Kayacik (FICO, United Kingdom); Mike Just (Heriot-Watt University, United Kingdom); Lynne Baillie (Glasgow Caledonian University & ITT Research Group, United Kingdom); David Aspinall (University of Edinburgh, United Kingdom) pp. 189-197

Inviz: Low-power Personalized Gesture Recognition using Wearable Textile Capacitive Sensor Arrays

Gurashish Singh and Alexander Nelson (University of Maryland, Baltimore County, USA); Ryan Robucci and Chintan Patel (University of Maryland Baltimore County, USA); Nilanjan Banerjee (University of Maryland, Baltimore County, USA) pp. 198-206

Understanding the Unobservable Population in Call Detail Records through Analysis of Mobile Phone User Calling Behavior: A Case Study of Greater Dhaka in Bangladesh

Ayumi Arai (University of Tokyo, Japan); Apichon Witayangkurn (Asian Institute of Technology, Thailand); Teerayut Horanont (Sirindhorn International Institute of Technology, Thammasat University, Thailand); Xiaowei Shao and Ryosuke Shibasaki (University of Tokyo, Japan) pp. 207-214

Targeted Vaccination Based on a Wireless Sensor System

Xiao Sun and Zongqing Lu (The Pennsylvania State University, USA); Xiaomei Zhang (Pennsylvania State University, USA); Marcel Salathe and Guohong Cao (The Pennsylvania State University, USA) pp. 215-220

Session 8: Security

Curbing Mobile Malware Based on User-Transparent Hand Movements

Babins Shrestha (University of Alabama at Bimingham, USA); Manar Mohamed, Anders Borg and Nitesh Saxena (University of Alabama at Birmingham, USA); Sandeep Tamrakar (Aalto University, Finland)

pp. 221-229

Measurement-driven Mobile Data Traffic Modeling in a Large Metropolitan Area

Eduardo M. R. Oliveira (Ecole Polytechnique, France); Aline Carneiro Viana (INRIA, France); Naveen Kolar Purushothama (INRIA Saclay, India); Carlos Sarraute (Grandata Labs, Argentina) pp. 230-235

Covert Channel Attacks in Pervasive Computing

Nilufer Tuptuk and Stephen Hailes (University College London, United Kingdom) pp. 236-242