2022 IEEE International Conference on Pervasive Computing and Communications (PerCom 2022)

Pisa, Italy
21 – 25 March 2022

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Tuesday, March 22 9:15 - 9:30

S0: Welcome Message

Chairs: Andrea Passarella (IIT-CNR, Italy), Carlo Vallati (University of Pisa, Italy)

Tuesday, March 22 9:30 - 11:00

S1: Machine Learning

Chair: Chiara Boldrini (IIT-CNR, Italy)

Acceleration-based Human Activity Recognition of Packaging Tasks Using Motif-guided Attention Networks
Jaime Morales, Naoya Yoshimura and Qingxin Xia (Osaka University, Japan); Atsushi Wada and Yasuo Namioka (Toshiba Corporation, Japan); Takuya Maekawa (Osaka University, Japan)
pp. 1-12

Weight Separation for Memory-Efficient and Accurate Deep Multitask Learning
Seulki Lee (Ulsan National Institute of Science and Technology, Korea (South)); Shahriar Nirjon (University of North Carolina at Chapel Hill, USA)
pp. 13-22

Resource-Aware Classification via Model Management Enabled Data Stream Optimization
Michael Sünkel and Golnaz Elmamooz (University of Bamberg, Germany); Marco Grawunder (University of Oldenburg, Germany); Phan Thai Hoang (University of Bamberg, Germany); Elke Rauch (Ludwig-Maximilians-University Munich, Germany); Lara Schmeling (Institute for Agricultural Engineering and Animal Husbandry, Germany); Stefan Thurner (Bavarian State Research Center, Germany); Daniela Nicklas (University of Bamberg & Faculty Information Systems and Applied Computer Science, Germany)
pp. 23-33

Tuesday, March 22 11:00 - 12:30

S2: Multimedia

Chair: Amy L Murphy (Fondazione Bruno Kessler, Italy)

OpCASH: Optimized Utilization of MEC Cache for 360-Degree Video Streaming with Dynamic Tiling
Chamara Madarasingha, Kanchana Thilakarathna and Albert Zomaya (The University of Sydney, Australia)
pp. 34-43

MRIM: Enabling Mixed-Resolution Imaging for Low-Power Pervasive Vision Tasks
 Ji-Yan Wu, Vithurson Subasharan, Tuan Tran and Archan Misra (Singapore Management University, Singapore)
 pp. 44-53

Context-driven Encrypted Multimedia Traffic Classification on Mobile Devices
 Mohammad A. Hoque, Benjamin Finley and Ashwin Rao (University of Helsinki, Finland); Abhishek Kumar (University of Oulu, Finland & University of Helsinki, Finland); Pan Hui (Hong Kong University of Science and Technology & University of Helsinki, Hong Kong); Mostafa Ammar (Georgia Institute of Technology, USA); Sasu Tarkoma (University of Helsinki, Finland)
 pp. 54-64

Tuesday, March 22 2:30 - 3:45

Keynote speech

Schahram Dustdar
 Chair: Christian Becker (Universität Mannheim, Germany)

Keynote: Engineering the New Fabric of the Distributed Compute Continuum
 Schahram Dustdar (Vienna University of Technology, Austria)
 pg. 65

Tuesday, March 22 4:15 - 5:45

S3: Healthcare and Smart Cities

 Chair: Abhishek Mukherji (Accenture Inc., USA)

CogAx: Early Assessment of Cognitive and Functional Impairment from Accelerometry
 Sreenivasan Ramasamy Ramamurthy (University of Maryland Baltimore County, USA); Soumyajit Chatterjee (IIT Kharagpur, India); Elizabeth Galik (University of Maryland, Baltimore, USA); Aryya Gangopadhyay (University of Maryland Baltimore County (UMBC), USA); Nirmalya Roy (University of Maryland Baltimore County, USA); Bivas Mitra (IIT Kharagpur, India); Sandip Chakraborty (Indian Institute of Technology Kharagpur, India)
 pp. 66-76

AiEEG: Personalized Seizure Prediction Through Partially-Reconfigurable Deep Neural Networks
 Daniel Uvaydov, Raffaele Guida, Pedram Johari, Francesco Restuccia and Tommaso Melodia (Northeastern University, USA)
 pp. 77-88

HVAC Power Conservation through Reverse Auctions and Machine Learning
 Enrico Casella (University of Kentucky, USA); Atieh R. Khamesi (Ericsson, USA); Simone Silvestri (University of Kentucky, USA); D. A. Baker and Sajal K. Das (Missouri University of Science and

Technology, USA)
pp. 89-100

Wednesday, March 23

Wednesday, March 23 8:30 - 9:50

S4: Internet of Things and Mobile Networks

Chair: Sukhpal Singh Gill (Queen Mary University of London & UK, United Kingdom (Great Britain))

Universal Space-Time Stream Backscatter with Ambient WiFi
Yifan Yang and Wei Gong (University of Science and Technology of China, China)
pp. 101-110

Fine-grained Stop-Move Detection in UWB-based Trajectories
Fatme Hachem (University of Milan, Italy); Davide Vecchia (University of Trento, Italy); Maria Damiani (University of Milan, Italy); Gian Pietro Picco (University of Trento, Italy)
pp. 111-118

CartaGenie: Context-Driven Synthesis of City-Scale Mobile Network Traffic Snapshots
Kai Xu (The University of Edinburgh, United Kingdom (Great Britain)); Rajkarn Singh (University of Edinburgh, United Kingdom (Great Britain)); Hakan Bilen (The University of Edinburgh, United Kingdom (Great Britain)); Marco Fiore (IMDEA Networks Institute, Spain); Mahesh K Marina (The University of Edinburgh, United Kingdom (Great Britain)); Yue Wang (Samsung Electronics, USA)
pp. 119-129

Wednesday, March 23 11:30 - 1:00

S5: Best Paper Session

Chair: Salil S Kanhere (UNSW Sydney, Australia)

SmartPhOx: Smartphone-Based Pulse Oximetry Using a Meta-Region Of Interest
Firmin Kateu (Institut National Polytechnique de Toulouse, France); Gentian Jakllari and Emmanuel Chaput (University of Toulouse, France)
pp. 130-140

Reservoir: Named Data for Pervasive Computation Reuse at the Network Edge
Md Washik Al Azad and Spyridon Mastorakis (University of Nebraska at Omaha, USA)
pp. 141-151

SmartSPEC: Customizable Smart Space Datasets via Event-Driven Simulations
Andrew Chio (University of California, Irvine, USA); Daokun Jiang (Google); Peeyush Gupta (University of California, Irvine, USA); Georgios Bouloukakis (Telecom SudParis, France); Roberto Yus (University of Maryland, Baltimore County); Sharad Mehrotra and Nalini Venkatasubramanian

(University of California, Irvine, USA)
pp. 152-162

Wednesday, March 23 2:30 - 3:45

Keynote speech

Daniela Rus
> Chair: Sajal K. Das (Missouri University of Science and Technology, USA)

Keynote: One Robot for Every Task
> Daniela Rus (MIT, USA)
> pg. 163

Thursday, March 24

Thursday, March 24 10:00 - 11:00

S6: Sensing

> Chair: Sandip Chakraborty (Indian Institute of Technology Kharagpur, India)

LuckyChirp: Opportunistic Respiration Sensing Using Cascaded Sonar on Commodity Devices
> Qiuyue (Shirley) Xue (University of Washington, USA); D Shin, Anupam Pathak, Jake Garrison, Jonathan Hsu and Mark Malhotra (Google, USA); Shwetak N. Patel (University of Washington, USA)
> pp. 164-171

ZEL: Net-Zero-Energy Lifelogging System using Heterogeneous Energy Harvesters
> Mitsuru Arita and Yugo Nakamura (Kyushu University, Japan); Shigemi Ishida (Future University Hakodate, Japan); Yutaka Arakawa (Kyushu University, Japan)
> pp. 172-179

RGB LED bulbs for communication, harvesting and sensing
> Muhammad Sarmad Shahab Mir (IMDEA Networks, Madrid & Universidad Carlos III de Madrid Madrid, Spain); Behnaz Majlesein (Universidad de Las Palmas de Gran Canaria, Spain); Borja Genoves Guzman (IMDEA Networks, Spain); Julio Rufo (IDeTIC-ULPGC, Spain); Domenico Giustiniano (IMDEA Networks Institute, Spain)
> pp. 180-186

Thursday, March 24 11:30 - 12:50

S7: Crowdsensing and Privacy

> Chair: Ella Peltonen (University of Oulu, Finland)

CountMeIn: Adaptive Crowd Estimation with Wi-Fi in Smart Cities
>Gürkan Solmaz (NEC Laboratories Europe, Germany); Pankaj Baranwal (NEC Laboratories Europe GmbH, Germany & University of Delhi, India); Flavio Cirillo (NEC Laboratories Europe, Germany)
>pp. 187-196

Privacy-Friendly De-authentication with BLUFADE: Blurred Face Detection
>Matteo Cardaioli and Mauro Conti (University of Padua, Italy); Pier Paolo Tricomi (University of Padova, Italy); Gene Tsudik (University of California Irvine, USA)
>pp. 197-206

Effect of User Expectation on Mobile App Privacy: A Field Study
>Ricardo Mendes (University of Coimbra, Portugal); André Brandão (CRACS/INESCTEC and CISUC, Portugal); Joao P Vilela (University of Porto, Portugal); Alastair R. Beresford (University of Cambridge, United Kingdom (Great Britain))
>pp. 207-214

Thursday, March 24 2:00 - 4:00

Panel

>Chair: Franco Zambonelli (University of Modena and Reggio Emilia, Italy)

Pervasive Autonomy: Humans-in-the-loop or Forget-about-them? Panel Summary
>Franco Zambonelli (University of Modena and Reggio Emilia, Italy); Virginia Dignum (UMEA University, Italy); Jeremy Pitt (Imperial College London, United Kingdom (Great Britain)); Giovanni Sartor (University of Bologna & European University Institute fo FLorence, Italy); Gregor Schiele (University of Duisburg-Essen, Germany)
>pp. 215-216

Thursday, March 24 4:30 - 6:00

S8: Activity Recognition

>Chair: Juan Ye (University of St Andrews, United Kingdom (Great Britain))

Adversarial Deep Feature Extraction Network for User Independent Human Activity Recognition
>Sungho Suh (German Research Center for Artificial Intelligence (DFKI), Germany); Vitor F Rey (Deutsches Forschungszentrum für Künstliche Intelligenz & University of Kaiserslautern, Germany); Paul Lukowicz (DFKI and University of Kaiserslautern, Germany)
>pp. 217-226

FedCLAR: Federated Clustering for Personalized Sensor-Based Human Activity Recognition
>Riccardo Presotto and Gabriele Civitarese (University of Milan, Italy); Claudio Bettini (Università degli Studi di Milano, Italy)
>pp. 227-236

ActiSight: Wearer Foreground Extraction using a Practical RGB-Thermal Wearable

Rawan Alharbi (Northwestern University, USA); Sougata Sen (Birla Institute of Technology and Science, Pilani, Goa, India); Ada Ng, Nabil Alshurafa and Josiah Hester (Northwestern University, USA)

pp. 237-246

Thursday, March 24 6:00 - 7:00

Closing and Town Hall meeting

Chair: Mohan J Kumar (Rochester Institute of Technology, USA)