

Welcome Message from the General Chairs

Welcome to the 17th edition of the IEEE International Conference on Sensing, Communication, and Networking: SECON 2020!

We would have wished to begin our foreword by welcoming you to beautiful Lake Como, Italy, where the conference was intended to take place. However, due to the pandemic of coronavirus, the in-presence event had to be cancelled. Nevertheless, we decided to replace it with a live event that, albeit attended remotely via conference tools, preserves and fosters as much as possible the interaction and sense of community that characterizes in-presence events in general, and SECON in particular.

Therefore, despite the difficulties induced by the pandemic, this year's edition continues the tradition of SECON in providing a unique forum that, by looking beyond current sensing, communication, and networking paradigms, emphasizes pioneering cross-disciplinary work as its signature footprint in the contemporary research landscape.

The Technical Program co-chairs Tarek Abdelzaher, Sung-Ju Lee, and Cecilia Mascolo, have carefully selected a technical program of 36 high-quality papers witnessing the diversity of topics addressed by the conference. The main program is complemented by outstanding keynote talks by Shyam Gollakota, Lama Nachman, and Patrick Baudish, offering perspectives from both academia and industry on intellectually intriguing and scientifically timely novel research topics. Finally, the main conference program is preceded by three workshops, selected among several submissions by our Workshop Chairs, Muhammad Hamad Alizai and Filip Lemic, on topics as diverse as crowdsensing for smart cities, autonomous unmanned vehicles, and security, trust, and privacy for cyber-physical systems.

The SECON event is made possible by a great team effort involving many volunteers. Delphine Reinhardt was incredibly efficient and meticulous in assembling the conference proceedings. Wan Du, Ambuj Varshney, and Jiliang Wang relentlessly advertised SECON on several channels, while Andrea Maioli did an excellent job in keeping our website up to date and managing the several tools that made a remote event possible. The Organizing Committee also included the finance chair, Simone Silvestri, the poster and demo chairs, JeongGil Ko and Rahul Shah, and the local arrangement chair, Alessandra Viale; although their involvement was severely reduced by the effects of the pandemic on the conference organization, they nonetheless enthusiastically participated in the early planning of the event.

Setting up a full-virtual, live, remote event is a complex task that we could not have done without the help of dedicated volunteers that are not part of the official Organizing Committee: our "Zoom Masters". Koustabh Dolui, Laura Feeney, Timofei Istomin, and Davide Vecchia did the heavy lifting of helping each author test their video conference equipment well before their presentation, and of ensuring that the actual event was run smoothly throughout its duration. If attendees enjoy the remote format of the event, a great part of the merit goes to these young researchers.

Finally, we would like to thank you, the authors and attendees, for making this conference a success even in these dire times! We look forward to seeing you all at the conference: although

we will not be able to meet you in person, it will be surely the occasion for interesting and thought-provoking interactions sparked by our program!

Luca Mottola (Politecnico di Milano, Italy and RISE Sweden)

Gian Pietro Picco (University of Trento, Italy)

SECON 2020 General Chairs

Welcome from the SECON Workshop Chairs

Workshops generally provide a critical enhancement to the main conference programs, as they allow discussions on more focused research topics in a less formal and highly interactive setting. We, the IEEE SECON 2020 workshop chairs, are therefore very pleased to present the IEEE SECON 2020 workshop program. This year's edition features three stimulating workshops, with their agendas including novel exciting developments in the domain of sensing, communication, and networking. Each individual workshop was organized and managed independently by its highly motivated organizers. We provided them with the assistance in the creation of high-quality programs, with the primary aim of allowing a significant amount of time for lively interaction and fruitful discussions. All workshop programs are further enriched by a keynote speech that provides an expert perspective, therefore challenging the attendees and building a strong base for technical sessions and corresponding discussions.

We would like to congratulate all the authors of the accepted papers, as well as thank them for their contributions to the workshop programs. We would also like to sincerely thank all the workshop organizers for their outstanding efforts and amazing execution of the workshops, as well as the keynote speakers on their exciting presentations. Last but not least, we would like to express our gratitude to the organizing committee of the IEEE SECON 2020 conference for their excellent guidance throughout the whole process, with special appreciation to Luca Mottola and Gian Pietro Picco, the IEEE SECON 2020 general chairs.

We believe that this year's workshops complement and enhance the IEEE SECON 2020 main conference program and we truly hope you will enjoy them. Finally, we strongly believe this year's workshops advance the state-of-the-art in their research fields, as well as contribute greatly to making the IEEE SECON one of the premiere venues in sensing, communication, and networking research.

IEEE SECON 2020 Workshop Co-Chairs
Muhammad Hamad Alizai (LUMS, Pakistan)
Filip Lemic (University of Antwerpen - imec, Belgium)

Welcome from the IoTSenCity 2020 Workshop Organizers

We are delighted to welcome you all to the 1st Workshop on IoT-CrowdSensing for Smart Cities (IoTSenCity) at IEEE International Conference on Sensing, Communication and Networking (SECON), held on 22-26 June, 2020 in Como (Italy). Due to the COVID-19 outbreak, the conference has moved to an online version.

This workshop aims to bring together worldwide experts in the areas of Internet of Things (IoT), context-aware computing and crowdsensing paradigms applicable in Smart Cities. The IoT is growing at a significant pace and several services are now built on the data obtained from connected smart objects. The emerging IoT paradigm with the Big Data paradigm, provides the foundations to extract common knowledge from data made available by humans, institutions, or smart objects for supporting decision making. The paradigms of Crowdsourcing and Mobile Crowdsensing (MCS) have long been used to seek contributions from a crowd of participants who commit to perform certain agreed tasks. With the omnipresence of IoT, underpinned by mobile smart devices, IoT-Crowdsensing (IoT-CS) is gaining increased interest where smart mobile devices and IoT devices undertake the task of collecting data about phenomena of interest.

Although fascinating and potentially disruptive, this paradigm inherently carries a set of technical challenges at various levels, which should be studied by different research communities. The workshop will present cutting edge solutions that address several of the above mentioned challenges. For example, it discusses the challenge of having smart interfaces that communicate with the user only when necessary, alongside with the battery efficiency, which plays a crucial role being IoT devices almost always battery powered. Furthermore, the challenge of leveraging participation in the crowd is discussed, in particular taking into account efficient incentivization paradigms which also involve education. Furthermore, the workshop addresses the challenge of predicting crowd distribution in smart cities in order to design efficient recruitment frameworks. Lastly, the workshop addresses the challenge of monitoring even in rural scenarios, where the requirements are even more stringent and the choice of communication technologies is extremely important. The workshop topics are then wrapped by our keynote speaker, who discusses the recent advances of IoT in Smart Cities with a particular focus on edge scenarios.

This international workshop has a celebrated keynote speaker and four research papers from various international researchers. The technical program committee rigorously reviewed the submission and we are very grateful to them. We would also like to thank the IEEE SECON 2020 organization committee and the workshop chairs for their support and guidance in making the workshop a successful event. We also thank all the authors for selecting the IoTSenCity 2020 workshop to submit their contribution.

We look forward to seeing you all at the workshop.

Federico Montori, Luca Bedogni and Prem Prakash Jayaraman

Welcome from the IAUV 2020 Workshop Organizers

We are delighted to welcome you all to the 2nd International Workshop on Internet of Autonomous Unmanned Vehicles organized in conjunction with the IEEE International Conference on Sensing, Communication and Networking (SECON) to be held on June 22, 2020.

Autonomous unmanned vehicle networks in civil applications are considered with increasing interest. Such networks are envisioned to consist of wireless sensors, robots and unmanned (aerial, ground, underwater) vehicles and are being used in environmental monitoring, border surveillance, network provisioning, delivery, construction, emergency or disaster assistance. The challenges in the design of these networks range from physical control of the vehicles, navigation, to communication limitations. Due to diverse and interdisciplinary nature of these challenges, algorithms and design principles proposed by networking, robotics, control theory, computer vision and artificial intelligence research communities will need to be utilized. IAUV aims to bring together state-of-the-art contributions on the design, specification and implementation of architectures, algorithms and protocols for current and future applications of autonomous unmanned vehicle networks, with a special focus on unmanned aerial vehicle (UAV) or drone networks.

IAUV is organized as a half-day workshop. We have Prof. Yasamin Mostofi as keynote speaker, who will give a talk entitled “Robotics Meet Wireless Communications: Opportunities and Challenges”. We also have three research papers from various international researchers. We would like to thank the technical program committee for their rigorous reviews of the submissions and the IEEE SECON 2020 organization committee and workshop chairs for their support and guidance in making the workshop a successful event. We also thank all the authors for selecting the IAUV 2020 workshop to present their work. We look forward to seeing you all at the workshop.

Evsen Yanmaz Adam, Enrico Natalizio, and Sabato Manfredi

Welcome from the IEEE STP-CPS 2020 Workshop Organizers

It is our pleasure to welcome all of you to the 2nd Workshop on Security Trust Privacy in Emerging Cyber-Physical Systems (STP-CPS) organized in conjunction with IEEE International Conference on Sensing, Communication, and Networking (SECON) on June 22-25, 2020.

This workshop aims to convene researchers from academia, industry, and government agencies to focus on understanding security challenges and attack surface of modern cyber-physical systems (CPS), and architect innovative solutions with the help of cutting-edge technologies that address the underlying security, trust, and privacy issues in CPS environments. Since CPS integrate computing and communication capabilities in physical objects for monitoring, control, and smart decision making in the physical world, trustworthiness of such systems is very critical. Sustainability and resiliency of the cyber-physical ecosystem, which has inherently distributed nature, demands to architect models and propose solutions that can suitably address the above-mentioned challenges. A multitude of CPS devices and applications exist in industrial, transportation, medical, home-security, building automation, emergency management, power, and many other systems, which serve critical functions in our lives. Given the popularity of the CPS applications, securing them against malicious activities is of utmost importance. Otherwise, malfunctioning and insecure CPS devices and applications can cause enormous damage to individuals, businesses, and nations.

This workshop presents cutting-edge research contributions on addressing security, privacy, and trust related challenges for better understanding the attack surface of modern cyber-physical systems. In the workshop, particular interests are given toward security of embedded systems, Internet-of-Things (IoT), SCADA Systems, Smart Grids, Critical Infrastructure Networks, Industrial IoT, Transportation Systems, and Medical Systems.

This International workshop encompasses one keynote talk by Dr. Aniruddha Gokhale, a reputed researcher and Professor from Vanderbilt University, Nashville, TN, USA, on “*Edge-based Machine Learning for Cyber Physical Systems*”. Additionally, the workshop contains six technical papers from various researchers across the globe. These technical papers were rigorously peer-reviewed by the technical program committee and we greatly appreciate their efforts. We are very thankful to the SECON-2020 organizing committee and the workshop co-chairs for the constant support in making STP-CPS workshop successful. We also thank the authors for choosing STP-CPS workshop to submit their valuable research contributions.

We look forward to meeting you all at the workshop.

Sachin Shetty, Uttam Ghosh, Deepak K. Tosh
Workshop Chairs, STP-CPS 2020