1st Workshop on Dependable Internet-of-Things Applications (DITA)

Marin Litoiu, *Dept of EECS, York University*, mlitoiu@yorku.ca
Hausi Müller, *Dept of Comp Sci, University of Victoria*, hausi@uvic.ca
Eleni Stroulia, *Dept of Comp Sci, University of Alberta*, stroulia@ualberta.ca
Lauren Sergio, *School of Kinesiology & Health Science, York University*, lsergio@yorku.ca
Natalija Vlajic, *Dept of EECS, York University*, vlajic@yorku.ca
Jenn McArthur, *Dept of Arch Sci, Toronto Metropolitan University*, jennifer.mcarthur@torontomu.ca
Manos Papagelis, *Dept of EECS, York University*, papaggel@eecs.yorku.ca
Marios Fokaefs, *Dept of EECS, York University*, fokaefs@yorku.ca
Sotirios Liaskos, *School of Information Technology, York University*, liaskos@yorku.ca

Abstract

As society and economy progressed through the information age to the age of "intelligent things" and cyber-physical systems, new challenges have risen. As digital systems become more interconnected with people and enter more aspects of daily life, their reliability becomes of paramount as it may not only disrupt economic activity, but also prove a security and safety hazard. Internet-of-Things, which is the umbrella term for all applications of interconnected intelligent digital devices, encompasses a number of technical aspects that span from software engineering and artificial intelligence to hardware-software co-design and data science. In 2018, a group of researchers across Canada put together the DITA NSERC CREATE (Collaborative Research and Training Experience) program. As a CREATE program, DITA aimed to provide unique training opportunities to undergraduate and graduate students on IoT, software engineering, data science and cybersecurity, along with their applications on domains such as health, civil engineering, and urban development. As a primarily industrial program, DITA forged a number of collaborations with local companies, which gave our trainees a chance for more practical experience through internships. Six years later, the 1st DITA workshop at CASCON aims at taking a retrospective look at the achievements of the DITA CREATE program and of its graduates. In addition, it aims at providing an outlook for future research on IoT and cyber-physical systems. Alumni of the program and industrial collaborators will talk about their experience with the program and their views on the future of IoT research.

Theme, goals and relevance

The general theme of the workshop is the development of reliable and dependable IoT applications and cyber-physical systems. Focusing on the technical aspect of the workshop, the following topics will be covered:

- End-to-End IoT Analytics and Assurance
- DevOps for IoT
- Security, Safety, Privacy and Ethics in IoT
- Smart Transportation
- Smart Buildings

- Remote Assisted Living

The goal of the workshop is twofold: a) discuss the value and benefits from programs such as the DITA CREATE programs for all involved parties, including students, principal investigators, knowledge and technology users, industrial partners and practitioners, b) discuss future opportunities and challenges for IoT research, with the objective of defining a roadmap and strategic goals for such research in the short and long term.

CASCON has traditionally embraced the training of the next generation of both scholars and practitioners. The 34 years of the conference are a testament to this tradition as many participants of the event have done while transitioning from students to principal investigators and senior practitioners. CASCON is the prime event for students in software and computer engineering and our workshop would be an excellent opportunity for them to hear about training programs outside their regular single-institution education. The same is true for academic scholars which can see DITA as a successful example for combining training and research through collaborations with industrial partners. The latter can see how they can benefit from highly qualified personnel and their research and expertise through internships. The main key performance indicator of our workshop would be the number of attendees. In the first iteration, we aim to attract 20-30 attendees in total (average 15 throughout the entire duration of the workshop). We will also assess the success of the workshop based on the number of accepted invitations for speakers and in the future by the number of publications or other dissemination that was motivated by our workshop.

Structure

The workshop will be primarily structured around invited talks. We will specifically target alumni of the CREATE program, to give their opinion on the value of such a program for research and development, as well as industrial partners of the program to discuss their benefits from the program and give an outlook on the future challenges for IoT research. For the first iteration of the workshop, we will host a half-day session with a typical length of two hours. We will host 3-5 invited talks each with an allotted time of 20-30 minutes (including discussion). In the end, we will also organize a roundtable discussion with all speakers, where the audience will have a chance to ask questions and bring together all the topics discussed during the entire session.

The purpose of the invited talks is first and foremost to guarantee the highest quality of presentation. We aim for our workshop to be firstly an advertisement of the CREATE programs and how they relate to students, academic researchers and industrial partners. As a long-running program, we also want to present our own perspective on IoT research, as we have experienced through the research of our alumni and our partners. Through the talks and the discussions in the workshop, the ultimate goal is to create a roadmap on “IoT research for the next 5-10 years.” This will motivate future events and guarantee continuous output for our group and for our participants. In the end, we intend to gather all this knowledge and experience, summarize it, and, with the permission of our speakers and attendees, submitted for publication in a venue like the IEEE Software magazine. Our goal is for every year to define a new theme, which will result in unique outcomes and eventually create a community that will benefit from this knowledge. We will further foster this sense of community through the roundtable discussions. Our intention is to bring our audience to the same level as our speakers, allow them to interact with each other, form new ideas and hopefully new collaborations.

Technical details

Format: Speakers

Duration: half day (2 or 3 hours)

Additional requests: A/V, connectivity (for potential Zoom presentations, although they will not be preferred).