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Cooperative Information Systems

28th International Conference, CoopIS 2022
Bozen-Bolzano, Italy, October 4–7, 2022
Proceedings

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General Co-chairs and Editors' Message for CoopIS 2022

The International Conference on Cooperative Information Systems (CoopIS 2022), held during October 4–7, 2022, in Bozen-Bolzano, Italy, further consolidated the importance of the series of annual conferences that were started in 2002 in Irvine, California. The conference then moved to Catania, Sicily, in 2003, Cyprus in 2004 and 2005, Montpellier in 2006, Vilamoura in 2007 and 2009, Monterrey, Mexico, in 2008, Heraklion, Crete, in 2010 and 2011, Rome in 2012, Graz in 2013, Amantea, Italy, in 2014, Rhodes in 2015, 2016, 2017, and 2019, and in Valletta in 2018.

Cooperative Information Systems (CISs) facilitate the cooperation between individuals, organizations, smart devices, and systems of systems by providing flexible, scalable, and intelligent services to enterprises, public institutions, and user communities. As a result, people and smart devices can interact, share information, and work together across physical barriers. The domain of CISs integrates research results from different related computing areas, such as distributed systems, coordination technologies, collaborative decision making, enterprise architecture, business process management, and conceptual modeling.

In recent years, several innovative technologies have emerged: cloud computing, service oriented computing, the Internet of Things, linked open data, semantic systems, collective awareness platforms, block chain, processes as a service, etc., which enable the next generation of CISs. In developing the next generation CISs, research is needed towards (1) the applicability and use of the above-mentioned innovative technologies, (2) approaches to develop CISs in particular catering to the multitude of stakeholders involved in the development of socio-cyber-physical systems, and (3) associated modeling techniques to express and analyze the different aspects of these systems in cohesion.

The CoopIS conference series is an established international event for presenting and discussing scientific contributions to technical, economical, and societal aspects of distributed information systems at scale. This 28th edition was collocated with the 26th edition of the Enterprise Design, Operations and Computing (EDOC) conference, and its guiding theme was "Information Systems in a Digital World."

As with the earlier CoopIS editions, the organizers wanted to stimulate this cross-pollination with a program of engaging keynote speakers from academia and industry. We are quite proud to list for this year:

– Daniel R. Isaacs, Digital Twin Consortium (CoopIS keynote)
– Stephen Mellor, Industry IoT Consortium (CoopIS/EDOC joint keynote)
– Jordi Cabot, ICREA, Spain (EDOC keynote)
– Carliss Y. Baldwin, Harvard Business School, (EDOC keynote)
– Giovanni Sartor, University of Bologna and the European University Institute of Florence (EDOC keynote)

We were once again able to develop a high-quality conference program for this edition. A total of 68 papers were submitted and a reviewing process by the CoopIS Program Committee (PC) was performed to professional quality standards: each paper review was assigned to at least three referees, with arbitrated email discussions in the case of strongly diverging evaluations. After this process, 15 submissions were accepted as regular papers and five as research in progress papers. In keeping with the international nature of CoopIS, the authors of the accepted papers originate from a variety of nations around the world.

We would like to express our thanks to everyone who helped make CoopIS 2022 a success. We especially want to express our thanks to the EDOC 2022 organization committee who helped us in organizing CoopIS 2022 and the authors who contributed papers on their research to CoopIS 2022, as well as the PC members and additional reviewers who promptly assessed the submissions and offered the authors insightful feedback.

October 2022

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CoopIS 2022 Keynotes

Understanding the Nature of Digital Twin – Digital Twin Challenges & Values; Empowering Businesses

Daniel R. Isaacs

Chief Technical Officer, Digital Twin Consortium

Short Bio

Dan Isaacs is Chief Technology Officer of Digital Twin Consortium, where he is responsible for setting the technical direction for the Member Consortium, liaison partnerships and business development support for new memberships. Previously, Dan was Director of Strategic Marketing and Business Development at Xilinx where he was responsible for emerging technologies including AI/Machine Learning, including defining and executing the ecosystem strategy for the Industrial IoT. Prior to joining the Digital Twin Consortium, Dan was responsible for Automotive Business Development focused on Automated Driving and ADAS systems. Dan represented Xilinx to the Industrial Internet Consortium (IIC). He has more than 25 years of experience working in automotive, Mil/Aerospace and consumer-based companies including Ford, NEC, LSI Logic and Hughes Aircraft. An accomplished speaker, Dan has delivered keynotes, presentations and served as panellist and moderator for IIC World Forums, Industrial IOT Global conferences, Embedded World, Embedded Systems, and FPGA Conferences. He is a member of international advisory boards and holds degrees in Computer Engineering: EE from Cal State University, B.S. Geophysics from ASU.

Talk

The term digital twin is being used with increasing frequency, but with little consistency, across multiple industries today. Digital Twin Consortium is working to address this and help industries better understand the advantages and value over the continuum of digital twins from discrete to complex.

Learn about the challenges the Digital Twin Consortium membership is working to address and its priorities. Gain a clear understanding through real-world use cases how businesses are recognizing value today through use of digital twins an enbaling technologies.

Trustworthiness in Industrial IoT Systems: trends and issues for the future Collaborative and Computing Enterprise

(Joint session with EDOC 2022)

Stephen Mellor

Chief Technical Officer, Industry IoT Consortium

Short Bio

Stephen Mellor is the Chief Technical Officer for the Industry IoT Consortium, where he aligns groups for business, technology, trustworthiness and industry for the Industrial Internet. He is a well-known technology consultant on methods for the construction of real-time and embedded systems, a signatory to the Agile Manifesto, and one-time adjunct professor at the Australian National University in Canberra, ACT, Australia. Stephen is the author of Structured Development for Real-Time Systems, Object Lifecycles, Executable UML, MDA Distilled and Models to Code. Stephen was Chief Scientist of the Embedded Software Division at Mentor Graphics, and founder and past president of Project Technology, Inc., before its acquisition. He participated in multiple UML and modeling-related activities at the Object Management Group (OMG), and was a member of the OMG Architecture Board, which is the final technical gateway for all OMG standards. Stephen was the Chairman of the Advisory Board to IEEE Software for ten years and a two-time Guest Editor of the magazine.

Talk

Trustworthiness, the combination of security, privacy, resilience, reliability and safety, is especially critical in industrial systems. Life, limb and the environment are at risk.

Unfortunately, these trustworthiness characteristics often conflict. Security would suggest locking that door, but safety demands it be able to be opened in case of emergency. This is resolvable, but often further factors must then be considered. (A bad actor could open the door from the inside. Now what?)

The Industry IoT Consortium has published the Trustworthiness Foundation, which outlines eleven principles to help guide you through the maze. This presentation will show how these principles can help you build a trustworthy system.

Contents

Research in Progress Papers