Special Issue on
Distributed Complex Systems:
Governance, Engineering, and Maintenance

Call For Papers

Distributed Complex Systems (e.g., Systems of Systems - SoSs) are gaining momentum due to the widespread adoption of Internet of Things (IoT) technologies and the increasing interest for smart cities, digital twins, and industrial cyber physical systems. The heterogeneity and large scale of these systems require novel design techniques, architectures and software infrastructures able to integrate independent (sub)systems to support their seamless cooperation and to address their emergent behaviors. In addition, the continuous servicing process enabled by the recent microservices paradigm leads to rely on evolving approaches able to anticipate, mitigate, or react to unplanned scenarios.

Each part of a Distributed Complex System can both exist as an independent entity and become part of wider systems when needed. This vision radically changes the notion of "integrated" system: (a) (sub)systems offer limited interaction capabilities and little possibility to be governed by other entities; (b) cooperation can be ad-hoc and only needed in specific cases or conditions; (c) in many cases there is no prior, complete, knowledge of the (sub)systems; (d) the behavior can be partially unplanned to follow environment or requirement changes.

The goal of this Special Issue is to bring together researchers and practitioners working on the design, the development, the validation, and the continuous maintenance of Distributed Complex Systems (e.g., SoSs, MultiAgent Systems, Adaptive Systems, Ambient Intelligent Systems). Indeed, topics on dynamic modules integration, autonomous reaction to unplanned or dynamic scenarios, or dynamic evolution of operational and managerial assets are in the scope of this special issue.

Topics

The list of relevant topics include but is not limited to:

- Modeling, design, and engineering of Distributed Complex Systems

- Architectures, architectural styles, architecture synthesis and middlewares for Distributed Complex Systems

- Foundations and formal methods for distributed complex systems

- Coordination and adaptation patterns

- Online V&V techniques for functional and non-functional assessment and dependability

- Online and offline testing techniques

- Context-awareness and context-aware adaptation techniques

- Reconfiguration and optimization techniques

- Self-* mechanisms

- Techniques for extracting behavior models from streams of continuous observations

- Applications, experiences, case studies, benchmarking, industrial perspectives of Distributed Complex Systems

- Distributed software engineering: strategies, processes, evaluation and methods

- Models of functional and non functional requirements, context and governance policies to support integration of Distributed Complex Systems

- Knowledge management and decision-making process in Distributed Complex Systems

- Ambient intelligent and multi-agent systems

- Interaction platforms enabling heterogeneous entities participation

- Knowledge bases integration support and exploitation for semantic interoperability

- Autonomic coordination, negotiation and interactions for multi-agent and complex systems

- Blockchain technology for distributed and heterogeneous systems

- Internet of Things-based Distributed Complex Systems

- Adaptive and reactive Distributed Complex Systems

Important Dates

- Papers Submissions: 28 February 2021

- First Notification: 15 May 2021

- Revised papers Submission: 30 June 2021

- Final Notification: 10 August 2021

Submission Guidelines

Authors should prepare their manuscript according to the Author Guidelines for the journal "Software: Evolution and Process", and that are available at: `https://onlinelibrary.wiley.com/page/journal/20477481/homepage/forauthors.html` . The manuscripts and any supplementary material should be submitted through the editorial system at: `https://mc.manuscriptcentral.com/jsme` . By following the submission instructions, please select "Distributed Complex Systems: Governance, Engineering, and Maintenance" when required by the system.

All the papers will be peer-reviewed following the reviewing procedures in place for the journal "Software: Evolution and Process".

Submitted manuscripts should not have been published previously nor be under consideration for publication elsewhere. If the submission is an extended work of a previously published conference or workshop paper, you must submit a cover letter detailing (1) the "Summary of Differences" between the Conference/workshop paper and extended version paper, (2) a clear list of "new and original" contributions in the extended version paper (identifying sections where they are proposed/presented), (3) confirmation of the percentage of new material (at least 30%), and (4) the related previously published conference/workshop papers.

Keywords

- Software Engineering for Distributed Complex Systems

- Evolution of Distributed Complex Systems

- Maintenance for Distributed Complex Systems

- Autonomic Computing Processes

- Self-healing Systems

Guest Editors

- Pietro Braione, University of Milano-Bicocca, Italy.

  Pietro Braione obtained his Ph.D. in Computer Engineering from Politecnico di Milano in 2004. He is currently a full-time researcher at the University of Milano-Bicocca. His research interests include software quality, automation of software testing, and program analysis.

- Daniela Briola, University of Milano-Bicocca, Italy.

  Daniela Briola obtained her Ph.D. in Computer Science from the University of Genoa in 2009 and is currently an Assistant Professor (with Italian "Tecnologo" role) at the University of Milano-Bicocca. Her research interests include software engineering, with focus on real time monitoring of interactive applications, and artificial intelligence, in particular multiagent systems, runtime verification of interaction protocols and knowledge representation. She is regularly involved in the program committees of many international conferences in her areas of interest.

- Guglielmo De Angelis, CNR-IASI, Italy.

  Guglielmo De Angelis obtained his Ph.D. in Industrial and Information Engineering from Scuola Superiore Sant'Anna of Pisa in 2007, and he is a researcher of the Italian National Research Council (CNR) at IASI in Rome. His research area is on software engineering, and specifically his focus is on the analysis, the design, and the validation of complex distributed software systems, often abiding by the service-oriented paradigm.

- Francesco Gallo, University of L'Aquila, Italy.

  Francesco Gallo obtained his Ph.D. in Computer Science and Application from University of L'Aquila in 2014 and is currently a Research Fellow at the Department of Information Engineering, Computer Science and Mathematics of the University of L'Aquila. His research interests include blockchain, system biology, self-adaptive software systems, and service-oriented systems.

- Francesco Poggi, University of Modena and Reggio Emilia, Italy.

  Francesco Poggi holds a Ph.D. degree in Computer Science and he is a junior Assistant Professor at the Department of Communication and Economics, University of Modena and Reggio Emilia. He works in the area of software engineering with a focus on self-adaptive systems, context modeling and semantic sensor networks.

- Giovanni Quattrocchi, Politecnico di Milano, Italy.

  Giovanni Quattrocchi obtained his Ph.D. in 2018 at the Politecnico di Milano, where he is currently Research Fellow. He works in the area of runtime control of cloud and edge systems, and on performances analysis of distributed systems possibly running in the cloud.