29TH INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES AND FACTORY AUTOMATION

ETFA 2024 PADOVA, ITALY SEPTEMBER 10TH-13TH 2024

Call for Papers
SS06 – Generative System Design for Autonomous Systems

Organized and Chaired by

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FOCUS. In an era where engineering complexity is escalating, the traditional methodologies for system design, especially in autonomous systems, are facing significant challenges. The advent of generative system design introduces a paradigm shift, promising to revolutionize the way we approach engineering tasks and processes. This Special Session on Generative System Design for Autonomous Systems at the forthcoming ETFA conference seeks to explore the frontier of generative methodologies in engineering. With an emphasis on generative AI, including evolutionary algorithms, generative networks, reinforcement learning, and large language models, this session is poised to showcase cutting-edge methodologies, insightful case studies, and the latest trends in the field. From conceptual designs to system-level integrations and component optimizations, the session will cover an extensive range of topics, emphasizing the transformative impact of generative system design in autonomous systems. We invite submissions that focus on, but are not limited to, the following topics:

TOPICS

- **Modelling of Automation Tasks and Processes:** Innovative approaches to representing and understanding complex automation tasks and processes within autonomous systems.
- **Simulation Techniques for Data Generation or Process Optimization:** Advanced simulation methodologies that contribute to efficient data generation, system testing, or process optimization in autonomous systems.
- **Large Language Models for System Synthesis:** Exploration of how large language models can be leveraged for the synthesis and integration of complex autonomous systems.
- **Neural Networks and Reinforcement Learning for Engineering Design:** Cutting-edge applications of neural networks and reinforcement learning in the context of engineering design, focusing on autonomous systems.
- **Design, Topology, and Process Optimization:** Novel strategies for optimizing the design, topology, and operational processes of autonomous systems, ensuring efficiency and adaptability.
- **Advanced Motion and Task Planning in Autonomous Systems:** This topic will explore innovative strategies and algorithms in motion planning and task execution within autonomous systems, emphasizing efficiency, safety, and adaptability in dynamic environments.
- **Integrating Symbolic and Subsymbolic AI for Enhanced System Intelligence:** This area will focus on the synergy between symbolic AI, with its rule-based processing and logical reasoning, and subsymbolic AI, such as neural networks, to create more robust and intelligent autonomous systems through knowledge-guided machine learning.

AIM

This Special Session aims to explore generative system design across a broad spectrum of engineering tasks and processes, including conceptual, system-level, and component design, as well as system synthesis and programming. Here, we seek to bring together experts and researchers from diverse fields to leverage generative AI, such as evolutionary algorithms, generative networks, reinforcement learning, or large language models, for streamlining and solving these intricate tasks. We aim to delve into cutting-edge methodologies, case studies, and emerging trends, emphasizing the role of generative system design in enhancing autonomy, adaptability, and efficiency. From machine learning to robotic systems, we invite contributions that showcase how to shape the landscape of autonomous technologies.

SOLICITED PAPERS

♦ Original Research (Regular) ♦ Surveys ♦ Industry practice ♦ Work-in-progress

The working language of the conference is English, For submission rules, please refer to the Author's Instruction on the conference website.

PAPER ACCEPTANCE

Accepted, registered, and presented papers will be copyrighted by IEEE and published in the conference proceedings. The proceedings will be available in the IEEE Xplore® Digital Library. The final manuscript must be accompanied by a registration form and a registration fee payment proof and it is mandatory that at least one author attends and presents the paper at the conference. Failure to adhere to these guidelines may result in paper exclusion from post-conference distribution via IEEEXplore by the ETFA 2024 Organizing Committee. All conference attendees must pay the conference registration fee and cover their own personal expenses for travel and accommodations.

AUTHOR'S SCHEDULE 2024

❖Regular and special sessions papers

Submission deadline ..... **April 28th**
Acceptance notification ..... May 31st
Deadline for final manuscripts ..... July 1st

❖Work-in-progress/ Industry practice papers

Submission deadline ..... **May 26th**
Acceptance notification ..... June 17th
Deadline for final manuscripts ..... July 1st

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