2nd ACM/IFIP Midd4DT 2024

Workshop on Middleware for Digital Twin, Hong Kong, China, December 03, 2024

In conjunction with 25th ACM/IFIP International Middleware Conference

CALL FOR PAPERS

Organizing Committee

Akram Hakiri
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Important Dates:

Submission deadline
September 23, 2024
Acceptance notification
October 20, 2024
Camera-ready papers
October 23, 2024
Workshop Date
December 03, 2024

Technical Program Committee:

Uttam Ghosh, Meharry Medical College, USA
Bassem Sellami, Tallinn University of Technology, Estonia
Nedra Mellouli, University of Paris 8. France
Nan Guo, Tennessee Tech University, USA
Pascal Berthou, LAAS-CNRS, France
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Ziran Min, Siemens, USA
Amira Mouakher, University of Perpignan, France
Montini Elias, Politecnico di Milano, Italy
Hella Kaffel, University of EL MANAR, Tunisia
Walid Barhoumi, University of Carthage, Tunisia
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Sadok Ben Yahia, University of Southern Denmark, SDU Denmark
Christine Louberry, University of Pau & Pays de l'Adour, France
Robert G Pettit, George Mason University, USA

ACM/IFIP Midd4DT 2024

Nowadays, the concept of Digital Twin (DT) is used in a wide variety of domains such as manufacturing, healthcare, smart cities, smart agriculture, smart grids, and mechanical engineering, to enhance the performance, enable proactive maintenance to extend the physical system's life, enhanced productivity, and faster innovation with reduced costs. Typically, the digital twin systems are generated and then synchronized using data flows in both directions between the real-world physical components and their virtual replica counterparts. Furthermore, a digital twin can enable continuous prototyping, and testing on-demand, without interruption, assuring and self-optimizing the forthcoming 5G network and beyond. It creates virtual replicas of physical systems in various application scenarios and maintains a device twin for every connected device.
Furthermore, Industrial Internet of Things (IIoT) middleware, service-oriented middleware, and many other middleware modernization approaches are providing a Virtual Automation Bus (VAB) to offer end-to-end connectivity between physical assets and the digital twin through many heterogeneous communication protocols, brokers, and messaging services, while ensuring interoperability among heterogeneous protocols and facilitating cross-layer interaction with the digital twin through VAB.

Topics:

The main goal of **ACM/IFIP Midd4DT 2024** workshop is to address these challenges and present advanced and innovative tools, techniques, models, architectures, specifications, architectures, and algorithms that bring diverse middleware technologies to DT in IoT applications and services. Contributions addressing both theoretical and practical applications, including, but not limited to, the following topics, are welcome for submission:

- *Recent Developments and Future Perspectives of DT-enabled middleware*
- *Middleware modernization for DT on the Edge-Cloud Continuum*
- *Digital twin middleware for Industrial IoT and Autonomous Systems*
- *Software Engineering, Model Driven Engineering, and Modelling digital twin data and architecture.*
- *Digital Twin Specification, standardization, interoperability, and representation*
- *Ontology modelling, linking, relationship and composition for Digital Twin*
- *Ontology-Defined Middleware and conceptual frameworks for Digital Twin*
- *Networking, orchestration, and communication middleware for Digital Twin*
- *Middleware framework for DT in Robotics, ROS, and Human–Robot Interactions*
- *Application of the digital twin in multi-dimensional intelligent and future industry*
- *Digital Twins in the Era of Web of Things: architectures and application scenarios*
- *AI/ML, Federated learning, TinyML, and Edge AI for DT Real-Time IoT*
- *Intelligent Edge, Fog, and cognitive Aspects of DT IoT beyond 5G*
- *Digital Twins Middleware for Real-Time IoT*
- *DT Security and Privacy for in Edge to cloud Systems*
- *Digital Twin in IoT application domains such as smart cities, smart farming and smart agriculture, agri-food sector, integrated energy systems, construction Industry, electric vehicle and autonomous vehicles, structural integrity, supply Chain, smart production, and logistics*

Guidelines for Manuscripts

The **Midd4DT 2024** proceeding will be published in the ACM Digital Library. Authors are invited to submit original, unpublished research. Papers must be written in English and strictly following **ACM SIGPLAN style (10pt font size)**. Papers are to be submitted through the **HotCRP system:** https://midd4dt24.hotcrp.com/
Two types of submissions are accepted:

- **Regular Research papers:** contributions should describe original work (**up to 6 pages** including all text, figures, references, and appendices).
- **Short Papers and position papers:** Research in progress, tools presentations, and new ideas (**up to 4 pages** including all text, figures, references, and appendices).

Submitted papers will be evaluated according to their rigor, significance, originality, technical quality, and exposition, by at least three distinct members of an international program committee.
At least one author of each accepted paper must register and participate in the workshop. Registration is subject to the terms, conditions, and procedures of the main conference: https://middleware-conf.github.io/2024/

For more information

More information about ACM/IFIP **Midd4DT**, including submission guidelines, can be found at: https://hakiri.github.io/MIDD4DT-24/