



21<sup>st</sup> IEEE International Conference on  
Industrial Informatics

17<sup>th</sup> - 20<sup>th</sup> July 2023 | Lemgo, Germany



## INDIN 2023 Special Session on

# SS 03 - Modelling for Diagnosis and Reconfiguration in Industrial Cyber-physical Systems

organized by

Organizer 1: Alexander Diedrich ([alexander.diedrich@iosb-ina.fraunhofer.de](mailto:alexander.diedrich@iosb-ina.fraunhofer.de))  
Fraunhofer IOSB-INA, Germany



*Alexander Diedrich received his B.Sc in Computer Engineering and M.Sc in Information Technology from OWL University of Applied Sciences and Arts, Lemgo, Germany. He is currently pursuing his PhD at Helmut-Schmidt-University, Hamburg, Germany and is working as a scientific employee at Fraunhofer IOSB-INA, Germany. He has published over 15 peer-reviewed articles on international conferences and has co-organized two international conferences. His research interests include automated fault diagnosis, causality research, automated model creation, and explainable artificial intelligence.*

Organizer 2: Kaja Balzereit ([kaja.balzereit@iosb-ina.fraunhofer.de](mailto:kaja.balzereit@iosb-ina.fraunhofer.de))  
Fraunhofer IOSB-INA, Germany



*Kaja Balzereit received the B.Sc. degree in Applied Mathematics and the M.Sc. degree in Optimization and Simulation from the Bielefeld University of Applied Sciences, Bielefeld, Germany, in 2016 and 2017, respectively. She is currently pursuing her PhD at Helmut-Schmidt-University, Hamburg and is working as a scientific employee at Fraunhofer IOSB-INA, Germany. For her Ph.D., she is researching symbolic AI methods for intelligent fault handling in hybrid systems, in order to increase the resilience of modern production facilities to external and internal disturbances and varying customer demands. Her research interests include logical reasoning, reconfiguration and explainable artificial intelligence.*

**Organizer 3: Silke Merkelbach (silke.merkelbach@iem.fraunhofer.de)  
Fraunhofer IEM, Germany**



*Silke Merkelbach received her B. Eng. in Industrial Engineering from Baden-Württemberg Cooperative State University (DHBW) Mannheim, Germany in a dual study programme in cooperation with Linde Engineering. She received her Dipl. Ing. in Process Engineering from TU Dresden, Germany. After two years as scientific employee at the chair of Process Control Systems & Process Systems Engineering, she started pursuing her PhD at Paderborn University and is working as a scientific employee at Fraunhofer IEM in Paderborn, Germany. Her research interests include industrial data analysis, hybrid modelling, automated model creation, and model transfer.*

**Organizer 4: Lukas Moddemann (lukas.moddemann@hsu-hh.de)  
Helmut-Schmidt-University, Germany**



*Lukas Moddemann received his B.Eng. in Mechanical Engineering from TH Cologne, Germany in a dual study in cooperation with MSSC AHLE GmbH. He received his M.Sc. in Mechatronics from University of Applied Sciences and Arts Aachen, Germany. After a year as Maintenance engineer at Continental AG in the Tires Division, he is currently working as a Scientific Employee and PhD student at Helmut-Schmidt-University Hamburg. His research interests include automated fault diagnosis, causality research, automated model creation, and explainable artificial intelligence.*

## Call for Papers

Model-based approaches are often used to handle the complexity of cyber-physical systems. As such, they are regarded as some of the core methods of artificial intelligence. In multiple disciplines the research community is concerned with the modelling of systems and their transfer in industrial applications. Within the different use cases, models can be created using a wide variety of approaches such as data-driven models, first-principles models, qualitative models, or hybrid models. Data-driven models are learned from process data and usually represent the normal working behaviour or a select number of fault types. First-principles models are usually created by experts and encompass lots of design-time knowledge. Qualitative models are more abstract than first-principles models, but thus must trade ease of use against accuracy. Hybrid models attempt to fuse expert knowledge with information gained from data, thus combining the benefits of both types of modelling. All of these approaches have their advantages and disadvantages. It is still highly important to research models which are practical and at the same time generalise to many cyber-physical systems, especially for tasks such as fault diagnosis and reconfiguration.

This special session shall bring together researchers to discuss methods, limitations, and research directions that help users to create accurate and usable models for the tasks of fault detection, fault diagnosis, and reconfiguration in industrial applications.

### Topics

- Learning of Causalities
- Model Transfer between Systems
- Fault Diagnosis
- Hybrid Modelling
- Reconfiguration
- Automated Model Learning

**Submissions Procedure:** All the instructions for paper submission are included in the conference website <https://2023.ieee-indin.org/index.php>

### Deadlines:

Deadline for submission of papers:	<b>March 01, 2023</b>
Notification of acceptance of papers:	<b>April 15, 2023</b>
Final manuscripts due:	<b>June 05, 2023</b>