INDIN 2023 Special Session on

SS 12 – Resource Awareness in Industrial Informatics

organized by

Principal Organizer: Dr. Padma Iyenghar, piyengha@uos.de
Affiliation 1: Entwicklungsprofessurin (Engl. equiv. Development Professor), Faculty of Engineering and Computer Science, University of Applied Sciences Osnabrueck, Osnabrueck, Germany
Affiliation 2: Functional Safety Engineer, Innotec GmbH, Erlenweg 12, 49324 Melle, Germany}

Short bio:
Padma Iyenghar is an "Entwicklungsprofessurin" (Engl. equiv. Development professor) at the University of Applied Sciences, Osnabrueck, Germany where she is active in teaching and research. In tandem, she is also a functional safety engineering consultant at Innotec GmbH, with her work time equally divided between university and industry. She was a post-doctoral researcher at the university of Osnabrueck, in the software engineering research group between 2014 and 2020, where she also received her doctoral degree in Computer Science (Dr. rer. nat.) in 2012. Her research interests include, among others, software engineering and

quality assurance (with focus on AI), functional safety software engineering; model-based software development and embedded software engineering.

Organizer 1: Arne Noyer (arne.noyer@ostfalia.de)
Affiliation: Ostfalia University of Applied Sciences, Suderburg, Germany

Short bio:
Arne Noyer is a Professor for IT Systems and Infrastructure at the Ostfalia University of Applied Sciences since July 2020. His subject areas include, among others, IT systems, computer architectures, computer networks, distributed systems, internet of things and IT security. Before this position, he worked as a senior software engineer and research manager at Willert Software Tools GmbH. Here and during his PhD period, a particular focus was on model-based system and software development for embedded systems.

Organizer 2: Tiago Carvalho (tdc@isep.ipp.pt)
Affiliation: School of Engineering of the Polytechnic Institute of Porto (ISEP), Portugal

Short Bio:
Tiago Carvalho is an assistant researcher at the School of Engineering of the Polytechnic Institute of Porto (ISEP), where he works in activities related to real-time parallel programming and timing analysis. He has a PhD in Compilers and a MSc degree in Computer Engineering from the Faculty of Engineering of the University of Porto (FEUP), where he is an invited assistant professor.

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Call for Papers:

Parallel computing platforms have revolutionized the hardware landscape by providing high-performance, low-energy, and specialized (viz. heterogeneous) processing capabilities to a variety of application domains, including mobile, embedded, data-center and high-performance computing. However, to leverage their potential, system designers must strike a difficult balance in the apportionment of resources to the application components, striving to avoid under- or over-provisions against worst-case utilization profiles. The entanglement of hardware components in the emerging platforms and the complex behavior of parallel applications raise conflicting resource requirements, more so in smart, (self-) adaptive and autonomous systems. This scenario presents the hard challenge of understanding and controlling, statically and dynamically, the trade-offs in the usage of system resources, (time, space, energy, and data), also from the perspective of the development and maintenance efforts.

Making resource-usage trade-offs at specification, design, implementation, and run time requires profound awareness of the local and global impact caused by parallel threads of applications on individual resources. Such awareness is crucial for academic researchers and industrial practitioners including the broad domain of Industrial Informatics. This special session is aimed at addressing the issues, opportunities, and challenges in resource awareness in the broad area of industrial informatics. This includes topics (but not limited to):

- Resource discovery, measurement, monitoring, controlling, and the multi-objective trade-offs that are applicable in software or computer engineering and system usage in the field of industrial informatics.
- Resource awareness in different domains and sectors such as (but not limited to) industry 4.0, smart manufacturing, adaptive and self-managing systems.
- Topics related to any kind of resources (time, energy, space, data, effort, safety, availability, etc.) and their utilization in development and usage of systems in our environment.
- Software engineering aspects in resource awareness such as software analysis, design, and development, testing (quality) and maintenance operations.
- Usage of state-of-the-art systems and software engineering methodologies such as model-driven software engineering in realization of techniques for resource awareness.
- Artificial intelligence, machine learning and evolutionary computing for realization of resource awareness (e.g., pros and cons, critical case studies)
- Economics and resource awareness in the context of industrial informatics

- Realization of resource awareness techniques from background theory to application of innovative solutions in different domains.
- Type of papers can be state-of-the-art, early ideas, work in progress, preliminary results, case studies, industrial cases and experience reports as well as early and preliminary research results.
- All aspects of mentioned techniques such as education, training, research, innovation, and practice.

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:	**March 01, 2023**
Notification of acceptance of papers:	**April 15, 2023**
Final manuscripts due:	**June 05, 2023**