



# 17th IFAC Symposium on Information Control Problems in Manufacturing Budapest, Hungary 7-9 June 2021 Budapest

## Open Invited Track

### Human-System Integration in Smart Manufacturing Control Systems

Session Code: 2tjs6

Sponsored by:

- IFAC TC 5.1 “Manufacturing Plant Control”.
- IFAC TC 5.3 “Integration and Interoperability of Enterprise Systems”.
- GRAISyHM (French acronym for Regional Federation of Research in Integrated Automation and Human-Machine Systems)

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### Abstract:

Over the past few decades, consumer needs have evolved from low-cost and little differentiated products to complex and highly customized ones. This evolution, coupled with the emergence of strong environmental and societal concerns, has changed the nature of manufacturing paradigms. Yesterday, the needs to reduce complexity and prioritize and integrate different levels of decision-making were primordial. Now, the focus must be set on real-time problem-solving and enhancing adaptability to a changing environment. Hence, calling for developing the ability to couple physical assets to their digital twin and improving the convergence of artificial intelligence, adaptive automation, know-how, and human expertise. These are the challenges of the Fourth Industrial Revolution and they will be implying major changes in our factories and supply chains' organization.

Industry 4.0 is relying on the integration/interoperation of smart things, services and people, and their virtual representations (i.e., digital twins) as networks within complex-adaptable systems. This vision is well represented by what we can be considered as the main pillars of Industry 4.0: Cyber-Physical Systems (CPSs) and Internet of Things (IoT). Those paradigms associated with advanced technological approaches that are using Artificial Intelligence (AI) should not only deeply change the manufacturing control system approaches, but also strong adaptation and cooperation of human-machine. Very few works exist on human-system integration in the manufacturing control field, and it is often limited to traditional human-machine interfaces developments, the adaptation of automation levels, and use of human-inspired algorithms or integration of human factors (e.g. fatigue) in optimization for scheduling. Questions of acceptability, comprehension or adaptation between humans and systems are often leftover.

Following this critical perspective, the main purpose of this open invited track is to identify research works and challenges on “human-system integration in smart manufacturing control systems” from an interdisciplinary perspective including automation control, computer science, organizational methods, social dimensions to mention a few relevant disciplines.

**This track will focus on (but not limited to):**

- Adaptive Automation Systems
- Anthropocentric Automation Systems
- Balanced Automation Systems
- Ethics of Automation
- Human-Centred Design
- Human Cyber-Physical Systems
- Human and Social Factors Integration
- Human-System Integration
  - Human(s)-Computer(s) Interactions
  - Human(s)-Machine(s) Interactions
  - Human(s)-Robot(s) Interactions
- Human and Cognitive Levels of Automation Adaptability
- Human and Physical Levels of Automation Adaptability
- Digital Lean Manufacturing and Jidoka 4.0 Systems
- Social Internet of Things, Services and People
- Work 4.0 / Operator 4.0 and its Social Dimensions

Submissions shall respect the normal procedure on papercept: <https://ifac.papercept.net/>

The authors have to select « **open invited track paper** » as submission type and use the track code (**2tjs6**) at the second step of submission.

If the theme of the paper is not suited to the track scope, the paper will be evaluated and considered for a regular session.

Please send an email with your intention to submit a paper to: [hind.el-haouzi@univ-lorraine.fr](mailto:hind.el-haouzi@univ-lorraine.fr)

**Key dates**

7th November 2020 - Draft manuscript submission

15th December 2020 - Notification to authors

1st February 2021 - Final paper submission deadline