

10th Triennial IFAC Conference on Manufacturing Modelling, Management and Control  
(MIM 2022)

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Special session: Intelligent algorithms on modern scheduling under industry 4.0 environment

**Session Co-Organizers:**

Prof. **Feifeng Zheng**, Glorious Sun School of Business and Management, Donghua University, China

E-mail: [ffzheng@dhu.edu.cn](mailto:ffzheng@dhu.edu.cn)

Prof. **Ming Liu**, School of Economics and Management, Tongji University, China

E-mail: [mingliu@tongji.edu.cn](mailto:mingliu@tongji.edu.cn)

Dr. **Zhaojie Wang**, Glorious Sun School of Business and Management, Donghua University, China

E-mail: [1189194@mail.dhu.edu.cn](mailto:1189194@mail.dhu.edu.cn)

Dr. **Zhixin Wang**, Glorious Sun School of Business and Management, Donghua University, China

E-mail: [wzx921009@163.com](mailto:wzx921009@163.com)

**Motivations:**

In the last decade, there has arisen the so-called fourth industrial revolution, known as Industry 4.0 (Zheng et al. 2020). Industry 4.0 is expected to contribute a significant impact on the manufacturing system in the future (Bajic et al. 2021). The concept of Industry 4.0 covers the Internet of Things, big data analytics, cloud technology, artificial intelligence, transportation, etc. (Sawik, 2020), and can directly support the process of scheduling activities (Parente et al. 2020). The past decade has seen the rapid development of new scheduling models and intelligent algorithms under the support of Industry 4.0. Even up until relatively recently, the application of machine learning in modern scheduling paradigms has also received considerable critical attention due to the continuous maturation and development of big data technologies.

In Industry 4.0, unpredictable events which lead to inevitable uncertainties during real-time decision-making is still the main challenge faced by manufacturing industry. Therefore, different methods supported by new intelligent technologies such as machine learning methods to cope with these uncertainties are also an interesting topic and fall in the domain of this special session.

**Main purposes:**

We hope to bring together experts in this field to introduce novel scheduling paradigms, and further develop new solution methods, especially the intelligent algorithms enhanced by machine learning technologies. We also encourage the insights of new intelligent technologies and theories on modern scheduling under industry 4.0 environment from different aspects.

**Submission:**

The authors can refer to for the guidelines <http://www.mim2022.com/>. All papers must be submitted electronically through the website: <https://ifac.papercept.net/conferences/scripts/start.pl>. Submitted manuscripts should be within six (6) pages.

**Main topics:**

This proposal supposes to give a state-of-the-art of stochastic modern scheduling methods under industry 4.0 environments. Scholar or engineer who is interested in this proposal can contributed related research papers including but not limited to the following topics:

- Introduce new scheduling or production paradigms and solve the relevant problems.
- Develop efficient and effective algorithms for solving the considered problems.
- Consider different types of uncertainties during scheduling processes.
- Develop effective intelligent algorithms enhanced by machine learning methods to respond to arrival scenario in real time, and compare with the state of the art.
- Consider the problem under new environmental regulations, such as green-oriented perspectives, both energy consumption and intensity limitation, and etc.

**The deadlines for IFAC MIM 2022:**

25 November 2021: submission of invited sessions

25 December 2021: submission of papers (6 pages in IFAC format)

15 February 2022: Notification to authors/ Start of registration

15 March 2022: Final paper submission

30 April 2022: Early registration rates expire

**References:**

- [1] Bajic, B., Rikalovic, A., Suzic, N., Piuri, V. (2021). Industry 4.0 Implementation Challenges and Opportunities: A Managerial Perspective. *IEEE Systems Journal*, 15(1): 546-559.
- [2] Parente, M., Figueira, G., Amorim, P., Marques, A. (2020). Production scheduling in the context of Industry 4.0: review and trends. *International Journal of Production Research*, 58(17): 5401-5431.
- [3] Sawik, T. (2020). A linear model for optimal cybersecurity investment in Industry 4.0 supply chains. *International Journal of Production Research*, doi: 10.1080/00207543.2020.1856442.
- [4] Zheng, T., Ardolino, M., Bacchetti, A., Perona, M. (2020). The applications of Industry 4.0 technologies in manufacturing context: a systematic literature review. *International Journal of Production Research*, doi: 10.1080/00207543.2020.1824085.