

Invited open proposal for IFAC MIM 2019

'Modeling and algorithms for new production modes combining service and manufacturing under uncertain environments'

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Chairs:

Prof. Feifeng Zheng, Donghua University, Shanghai, China

Prof. Ming Liu, Tongji University, Shanghai, China

Junkai He, Donghua University, Shanghai, China

Motivations:

The last few years have witnessed the emergence of a fourth industrial revolution, referred to as Industry 4.0 (Rossit et al., 2018). In the era of Industry 4.0, disruptive innovations such as digitalization and Industry 4.0 influence the development of new paradigms, principles, and models (Ivanov et al., 2018). Therefore, there is a trend to study new optimal control and risk-averse strategies, integrating the production scheduling and Industry 4.0 systems (Ivanov et al., 2017; Dolgui et al., 2018). Among them, an important branch is to develop new production modes for current manufacturing industries, such as considering personalized and service levels from the perspective of customers. The reason is that customers no longer only pursue singular and cured products. Therefore, personalized and customized manufacturing is becoming popular in recent years (A typical example is the personal orders of laptops). To this respect, we focus on gathering recently new developments and production modes in manufacturing, integrating service applications.

However, unexpected data volumes, complicated information and diversified demands undoubtedly bring plenty of challenges for current and future manufacturing. All these uncertainties greatly impact the stability, resilience, and sustainability of manufacturing processes. For the uncertain information, it can be completely obtained or only partially obtained (due to a lack of historical data). Therefore, different methods for handling the uncertainties in these scopes are welcomed, such as robust optimization, stochastic scheduling, chance-constrained method, distribution-free approach, distributionally robust optimization, and etc.

Main topics:

This proposal supposes to give a state-of-the-art of production modes under uncertainties in service and manufacturing systems. Any expert, scholar or engineer who is interested in this proposal can contribute related research papers including but not limited to the following topics:

- *Study new scheduling or production modes (problems), such as the interaction between companies and customers, the multitasking phenomenon, and etc.*
- *Consider the problems in different industrial background, such as assembly/disassembly industries, garment industries, metal industries, and etc.*
- *Consider the problems under different types of uncertainties, such as uncertain demand volumes, uncertain demand types, uncertain machine availability, uncertain job processing times, and etc.*

- Consider the problems with green-oriented perspectives, such as energy consumption or contaminant emission from sustainable and green purposes.
- Use different approaches for handling uncertainties, such as: stochastic programming, robust optimization, distribution-free approach, distributionally robust optimization, and etc.
- Use different scheduling types, such as single machine scheduling, parallel machine scheduling, single-stage scheduling, multi-stage scheduling, flow shops, job shops, open shops, and etc.

Main purposes:

The purpose is to bring together experts in this field and attract papers with high qualities, so as to collect new and innovative manufacturing modes, and develop new models and algorithms for them. We greatly encourage the insights of new technologies and theories on operating uncertainties from different aspects

Submission:

The authors can refer to www.ifac-control.org for the guidelines. All papers must be submitted electronically using the Symposium Manuscript Management System (CMMS) that are prepared in a 2-column style with respect to the manuscript style of IFAC. One should apply the official IFAC instructions and templates for introducing your works in a full-length manuscript. Submission details are available on the symposium website. All submissions must be written in English. All papers that conform to the submission guideline will be peer-reviewed by IPC members. The corresponding author submits the paper online (pdf. format) as an open invited paper. Several international journals listed in Web of Science are associated with MIM 2019 for the publication of special issues.

Important dates:

Deadline for submissions: December 15, 2018

Notification of acceptance: February 20, 2019

Submission of final draft: March 15, 2019

Expiration of Early Registration: March 31, 2019

For more submission information, please refer to <https://ifac.papercept.net/conferences/scripts/start.pl>

References:

- [1] Dolgui A., Ivanov D., Sethi S. P. and Sokolov B. (2018). Scheduling in production, supply chain and Industry 4.0 systems by optimal control: fundamentals, state-of-the-art and applications. *International Journal of Production Research*, DOI: 10.1080/00207543.2018.1442948.
- [2] Rossit D. A., Tohmé F., and Frutos M. (2018). Industry 4.0: smart scheduling. *International Journal of Production Research*, DOI: 10.1080/00207543.2018.1504248.
- [3] Ivanov D, Dolgui A, and Sokolov B. (2017). Scheduling of recovery actions in the supply chain with resilience analysis considerations. *International Journal of Production Research*, 56(19): 6473-6490.
- [4] Ivanov D, Dolgui A, and Sokolov B. (2018). The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytic. *International Journal of Production Research*, DOI: 10.1080/00207543.2018.1488086.