

**Invited open proposal for IFAC MIM 2019**

**'Smart scheduling for new logistics modes under uncertain environments'**

*9th IFAC Conference on Manufacturing Modeling, Management, and Control (MIM 2019)*

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**Chairs:**

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**Motivations:**

Industry 4.0 has attracted enough attention since it was first proposed. The last few years have witnessed its emergence and development (Wang, Ong, and Nee 2017; Xu 2018). Moreover, it has amounted to a paradigm change in manufacturing and transporting processes, based on the use of automated tools (Tao et al. 2017). A trend to study new optimal control and risk-averse strategies, integrating the logistics scheduling and Industry 4.0 systems has also been concerned (Dmitry et al., 2017; Alexander et al., 2018). With the continuous development of logistics lines (sea, land and air), today's logistics can cross every corner of the world, thus bringing the distance between the global enterprises closer (Zheng et al. 2018). Industry 4.0, as a new model, makes enterprise production and transportation more transparent and efficient. At the same time, its customization function makes the enterprise have higher flexibility. This requires a more efficient and intelligent logistics to promote the globalization of the industry. Therefore, smart scheduling for new logistics modes may be an important focus among them. The development of the logistics is shifting from the traditional "big and complete" to the "small but fine". This also requires deep integration of multi-faceted and multi-sectoral plans, and proposes new challenges of resource configuration and scheduling. Therefore, in this proposal, we focus on gathering recently new developments of smart scheduling for logistics modes.

However, uncertainties due to emergency events, complicated information and diversified demand propose lots of challenges for new logistics modes. The uncertainties, to a large extent, can impact the stability, resilience, and sustainability of transporting processes. Moreover, the uncertain information can be completely or partially known. Therefore, models and algorithms to handle uncertainties in these scopes are welcomed, such as stochastic scheduling, multi-stage scheduling, robust optimization, chance-constrained method, distribution-free approach, and etc.

**Main topics:**

This proposal supposes to give a state-of-the-art of smart scheduling for logistics modes under uncertainties in logistic system. Any expert, scholar or engineer who is interested in this proposal can contribute related research papers including but not limited to the following topics:

- *New scheduling or logistics modes (problems), such as automated system scheduling, big data-based scheduling, multimodal transportation, personalized transportation, and etc.*
- *Green-oriented perspectives, such as energy consumption or contaminant emission from sustainable and green purposes, and etc.*
- *Different types of uncertainties, such as uncertain processing times, uncertain arrival times, uncertain events, uncertain machine availability, and etc.*
- *Different approaches to handle uncertainties, such as: stochastic programming, robust optimization, distribution-*

*free approach, and etc.*

- *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.*

For the above topics, we encourage researchers to present problem-based analysis and develop innovative methods, which can be reflected by proposing models, heuristics or meta-heuristics, approximation algorithms.

### **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 logistics 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](http://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] Alexandre D., Dmitry I., Suresh P. S., and Boris S. (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.
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- [3] Tao F., Cheng Y., Zhang L., and Nee A. Y. (2017): Advanced Manufacturing Systems: Socialization Characteristics and Trends. Journal of Intelligent Manufacturing, 28 (5): 1079-1094.
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- [5] Xu X. (2018): Machine Tool 4.0 for the new era of Manufacturing. The International Journal of Advanced Manufacturing Technology, 92(5-8): 1893-1900.
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