Proposal for Special Session at IEEE CASE 2022

Goal:

In recent years, the rising new generation of information technology represented by industrial Internet, the development of systems optimization, and artificial intelligence have promoted the optimization of operations management. For the manufacturing industry, promoting the smooth circulation of resources, energy, and logistics within a single enterprise and among enterprises is the key means to reduce costs and increase benefits. Under such situation, scholars and industrial practitioners have begun to focus on the operations management of Manufacture-Circulation Industrial System (MCIS). MCIS refers to the network of clusters formed by manufacturing enterprises involving supply-demand relationships and exchanges of resources, energy, logistics, and information. The circular network formed by circular elements among the enterprises is the macro-circulation, and the one formed by circular elements within a single enterprise is the micro-circulation. Applying systems optimization and artificial intelligence to MCIS is critical in implementing smart circulation strategies for industry development.

The goal of this special session is to explore innovative fusion structure of data analytics and optimization for MCIS. Under such structure, data analytics and optimization are combined to further improve the intelligent capability and operational efficiency of MCIS. On the one hand, the fusion of data analytics and optimization demonstrates the utilization of existing optimization methods to further open the "black box" in industries and improve the prediction and control of unknown areas. On the other hand, it reveals the potential of data analytics methods to discover hidden knowledge, and thus improve decision-making efficiency. Broad aspects and issues will be well discussed.

The topics include, but are not limited to the following research fields:

- Production Planning and Scheduling
- Logistics Planning and Scheduling
- Energy Analytics and Scheduling
- Quality Analytics and Optimization
- Optimization of Micro-circulation in Enterprise
- Optimization of Macro-circulation among Enterprises
- Data Analytics for Manufacture-Circulation Industrial System
- System Modeling and Optimization Methods

Session Title: [Data Analytics and Optimization for Manufacture-Circulation Industrial System]

Organizers:

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Contributions:

1. "Diversity Guided Production Inventory Control in Automobile Manufacturers" by Lue Tao, Weihua Chen, Gongshu Wang, Lijie Su, Yang Yang, Yun Dong

2. "Capacitated Lot Sizing Problem with Family based Setup and Downstream Processes based Demand" by Yuming Zhao, Gongshu Wang, Yang Yang, Lijie Su

3. "A hybrid SARIMA-LSSVM model for steel inventory forecasting" by Junting Huang, Yun Dong, Chang Liu, Ying, Meng

4. "Modeling and solution for multiobjective order planning problem in mutilple production stages" by Weiyan Jia, Yang Yang, Lixin Tang

5. "Optimal emergency allocation of crude oil considering energy security and random demand" by Lijie Su, Lixin Tang, Guang Song, Junpeng Qu

6. "Balancing Production Capacity of Steelmaking by Considering the Demands of Downstream Processes" by Gongshu Wang, Sibo Liu, Lixin Tang