Proposal for Special Session at IEEE CASE 2022

Goal:

- [Robotized manufacturing systems, such as automated assembly lines, hoist systems, and semiconductor cluster tools, are widely adopted in the industries. As a kind of highly automated and computer-controlled systems, it is a great challenge to effectively operate such systems. Modeling, performance evaluation, scheduling, operations, and control of such systems are necessary in order to reduce production cost, increase productivity, guarantee safety, improve quality, and save resource and energy. The session aims to bring researchers, engineers, scientists, and managers engaged in research, development, and operation of robotized manufacturing systems to tackle various modeling, scheduling, operation, and control issues in such systems subject to different settings. Prospective authors are invited to share their academic results and practical experiences to deal with these challenging issues in this area.]

Session Title: [Modeling, Control, and Scheduling of Robotized Manufacturing Systems]

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Contributions:

1. "Modeling and Deadlock analysis for Cluster Tools with A Single-arm Robot and Multi-functional Process Modules" by WenQing Xiong/Yan Qiao/LiPing Bai/BaoYing Huang/NaiQi Wu/Jie Li

2. "Robotic Flow Shop Scheduling with Look-ahead based Reinforcement Learning" by Hyun-Jung Kim/Jun-Ho Lee

3. "Reinforcement Learning for Integrated Scheduling of Production and Material Handling Systems" by Duyeon Kim/Hyun-Jung Kim

4. "Wafer Loading Control in Cluster Tools for Semiconductor Manufacturing" by Minchan Kim/Tae-Sun Yu

5. "Petri net-based Modeling and Scheduling of High Throughout Screening System for Enzymatic Assay" by NaiQi Wu/Yan Qiao/ZhiWu Li/Abdulrahman M. Al-Ahmari/Abdul-Aziz El-Tamimi/Husam Kaid

6. "A Novel Cyclic Scheduling Approach to Time-Constrained Single-Arm-Robot Multi-Cluster Tools" by Jipeng Wang/Huan Xue/Qibiao Yang/Chunrong Pan

Proposal 5 submitted to 2022 IEEE 18th International Conference on Automation Science and Engineering (CASE). Received January 17, 2022.

7. “Design of Petri Net Supervisors for Discrete Event Systems with Two Control Specifications” by ChengZong Li/YuFeng Chen/ZhiWu Li

8. “Optimized supervisory control for manufacturing systems via Petri net structure reduction and partial order technique” by Depei Zhang/Gaiyun Liu/Ziliang Zhang

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