

## Proposal for Special Session at IEEE CASE 2022

### Goal:

Quality and reliability are crucial to the industrial automation as they greatly affect the product consistency, industrial process stability and equipment safety in a variety of industries. Appropriately modeling and evaluating industrial processes, by developing cutting-edge process analytical tools have become an essential approach to improve the quality and reliability of industrial systems. With the advancement and increasing industrial applications of artificial intelligence, machine learning and advanced sensing technologies, the data informatics and analytics incorporating the AI and machine learning tools will substantially provide additions to the field of quality and reliability engineering.

In this special session, the organizers focus on the quality and reliability issues from an industrial automation perspective, and collect the latest researches and achievements with innovative machine learning and AI technologies for the quality and reliability assessment. By sharing the state-of-the-art data analytical tools in this session, it is believed that the advanced data analytical tools powered by AIs and machine learning techniques can promote the development of quality and reliability both at academical and industrial levels. The topics include but are not limited to:

- Interpretable AI and Machine Learning Technologies
- Data-Driven Methods for Quality & Reliability Assessment
- New AI tools for Maintenance Optimization
- Data-Driven Methods for Diagnosis and Prognosis of Engineered Systems
- Process Anomaly Detection and Diagnosis
- Large-Scale Engineering Data Analytics
- Other Industrial Applications of Data Science

**Session Title:** [Machine Learning and AIs for Quality & Reliability Assessment and Enhancement]

### Organizers:

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### Contributions:

1. “A hybrid transfer learning framework for in-plane freeform shape accuracy control in Additive Manufacturing” by Kai Wang from Xi’an Jiaotong University
2. “Intelligent bearing fault diagnosis based on scaled Ramanujan filter banks in noisy environments” by Yongxiang Li from Shanghai Jiaotong University

3. “Bayesian closed-loop robust process design considering model uncertainty and data quality” by Linhan Ouyang from Nanjing University of Aeronautics and Astronautics
4. “Application of multi-agent reinforcement learning in maintenance optimization” by Yifan Zhou from Southeast University
5. “Fault diagnosis method of planetary gearbox based on residual capsule network” by Jinhua Mi from University of Electronic Science and Technology of China
6. “An artificial neural network supported stochastic process for degradation modeling and reliability assessment” by Di Liu from Beihang University