# SPECIAL SESSION

## OPTIMIZATION METHODS AND DATA ANALYTICS: APPLICATIONS IN ENGINEERING AND INDUSTRY 4.0 AND LARGE SCALE SUPPLY CHAINS

The business world is changing and demands the integration of various engineering techniques to make the operation of the system in general more efficient. Optimization, information security and a prospective business vision is essential for companies to be more productive. The application of new technological solutions to manufacturing and management processes is one of the ways through which digital transformation in the supply chain advances, on the road to industry 4.0. To achieve this, optimization techniques, soft computing, machine learning and Big Data technologies must be combined. With this integration it is possible to work with real-time sensed data to build and simulate Digital Twins with very high precision.

In the past decades, many nature-inspired optimization algorithms have been developed and applied successfully for solving a wide range of supply chain optimization problems. Although these techniques have shown good performance when applying to small or medium sized problems, however they still encounter serious challenges when applying to large scale problems. In today's global business environment, an effective and reliable supply chain substantially increases a company's competitive advantage. Supply chain management has played a crucial role in a business's success. Optimization has been sought to model and solve many of these supply chain problems.However, as the size of the optimization model grows, the difficulty of finding the optimal or near-optimal solution typically grows exponentially. For this reason, decomposition algorithms have been developed to tackle the large-scale optimization problems. Decomposition permits the easy obtention of some sensitivities that are difficult to obtain from the initial problem. Supply chain optimization problems with a decomposable structure that can be exploited through a decomposition techniques.

After the conference, authors of best presentations will be invited to submit their original work to special issues of top-level journals.

We encourage interested researchers to submit their original and unpublished work.

**Potential topics include, but are not limited to:**
- Global supply chains
- Network design and site location involving multimodal transportation
- Transportation, autonomous vehicles, drones, and vehicle routing
- Operations and supply chain design
- Assembly/distribution supply chains
- Optimization in cloud computing
- Optimization in parallel computing.
- Optimization in logistics, mobility and green supply chains.

- Analytics, machine learning, big data exploration in engineering problems and health science.
- Large scale optimization, Stochastic Optimization and Optimization under uncertainty.
- Optimization-simulation models in industry 4.0 and supply chain management.
- Evolutionary computing, swarm intelligence and other metaheuristics for manufacturing process optimization and logistics optimization
- Digital twins, discrete event simulation, system dynamics in supply chain management.
- Fuzzy logic and fuzzy systems' integration within supply chain.
- Soft computing methodologies
- Integration of computer technologies in Life Cycle Assessment for the Supply Chain.
- Modeling and optimization of edge and IoT system.

**Organizer:**

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