Proposal for Special Session at ICNSC'23

Session Title: Recent advances in smart and sustainable manufacturing

Description and Aim:

In today's highly competitive markets, sustainability is quickly becoming a priority for manufacturing companies to consider in addition to time, quality, and cost. A sustainable future requires a holistic view of systems: environmental, economic, and social factors must be considered to meet the needs of the present without compromising the ability of future generations to meet their own needs. Many environmental laws and regulations are already in place today, such as increasing electricity tariffs and fuel prices, carbon footprint reduction and energy consumption, which already show the importance of the issue. The manufacturing industry, as a major consumer of energy and resources, must adapt to the new circumstances and break new ground. Therefore, a comprehensive approach that considers both the product and, in particular, the processes required for its production is needed. Furthermore, new strategies and business models are needed to lead companies into a sustainable future. Moreover, Manufacturing companies are increasingly adopting information technologies and data driven methodologies to have a complete and accurate view of their processes. Even though the manufacturing environment produces an immense amount of data through various sensors, the lack of well-integrated solutions is hindering the potential of digitalization in advanced planning and process control systems. Consequently, decision-making becomes challenging, and decision makers as well as operators often rely on their experience. Integrating smart manufacturing through the latest advances in analytics and machine learning into manufacturing decision-support technologies can help overcome these challenges and fully leverage the benefits of AI and digitalization towards sustainable and smart manufacturing environment.

This special session will provide a forum to investigate, exchange novel ideas and disseminate knowledge covering the broad area of smart and sustainable manufacturing in nowadays industry. Experts and professionals from academia, industry, and the public sector are invited to submit papers on their recent research and professional experiences on the subject. High quality papers reporting on relevant reviews of existing literature, theoretical studies, case studies, inter-disciplinary research are all very welcome.

The potential topics include (but are not limited to):

Artificial intelligence and decision aid techniques for sustainable manufacturing

Data driven approaches for process planning, production planning and scheduling.

Green manufacturing, sustainable production, and supply chains

Intelligent manufacturing systems and smart factory

Adaptable optimization models for manufacturing decisions.

Optimization approaches for shop floor scheduling and control.

Integration of machine learning and mathematical programming for. Sustainable manufacturing.

Machine learning based algorithms for quality control.

Human-centric decision support systems.

Expected number of papers: 5

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