

## **ARCAI 2024 Special Session "Data-Driven Innovations and Intelligent Optimization for Complex Systems"**

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### **Call for Papers:**

Amidst the rapid advancements in information technology and data science, a wide range of practical processes across industries such as manufacturing, transportation, electronics, materials engineering, and supply chain management have undergone profound transformations. These processes continuously generate and store large amounts of operational data in real time, which contains detailed information about the dynamics of the processes and the condition of the equipment. The strategic use of this data, through both real-time and historical analysis, to predict trends, evaluate operational efficiency, and support decision-making in complex systems is crucial, especially in cases where precise control is lacking. However, the complex nature of the data—marked by high dimensionality, nonlinearity, heterogeneity, and inherent uncertainty—makes existing analytical, modeling, and control algorithms insufficient for effective management. This Special Session aims to delve into the latest advancements, emerging trends, and novel methodological approaches in the analysis, modeling, and governance of decision-support systems, along with their practical implementations. Topics of the Session include but are not limited to:

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- Machine learning and deep learning for complex system analysis
- Big data analytics for system performance evaluation
- Data-driven optimization algorithms for industrial processes
- Intelligent decision-making systems for logistics and supply chain management
- Smart control strategies for autonomous transportation systems
- Advanced modeling techniques for metallurgical processes
- Cybersecurity and cybernetics in complex system networks
- Applications of data-driven methods in electronic design and manufacturing

Accepted and presented papers will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements and indexed by EI Compendex and Scopus. Selected papers will be invited to SCI Journal Special Issues.