Special Issue

Optimization and Machine Learning-Based Methods in Air Traffic Management and Aeronautical Domains

Message from the Guest Editor

Dear colleagues, In the domain of Air Traffic Management and Aeronautics, optimization and machine learning techniques are crucial for addressing the challenges posed by increasing air traffic and the growing demands for safety, efficiency, and environmental sustainability. Traditional approaches face limitations in managing complex air traffic systems. Optimization methods, including mathematical programming and heuristic algorithms, are applied to optimize airspace resource allocation, flight path planning, and airport ground traffic scheduling, aiming to enhance airspace capacity, reduce flight delays, and lower operational costs. Machine learning approaches, such as supervised learning, unsupervised learning, and deep learning, leverage vast amounts of historical data to uncover underlying patterns and trends. They enable accurate air traffic flow prediction, flight risk assessment and early warning, and intelligent aircraft performance monitoring, thereby providing robust decision-making support. The integration of optimization and machine learning offers new pathways for tackling intricate problems in Air Traffic Management and Aeronautics.

Guest Editor

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The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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