

Modeling and Optimization in Traffic Flow Management

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Abstract

A safe and efficient aviation industry is vital to the global economy. The growing traffic demand, rise in oil prices, delays in building new runways and security issues are putting pressures on the system to evolve from the current procedure-based human-centered system to a more flexible system with higher levels of automation. Traffic Flow Management (TFM) is the efficient organization of traffic flows to meet demand taking into account capacity constraints at airports and in en route airspace. TFM involves thousands of aircraft and several layers of decision-makers scattered between the FAA, Airlines and other users of airspace. Several types of uncertainties are pervasive in the system. This talk explores the complexity and richness of the problems in TFM by considering research in four different areas: (a) Characteristics of the TFM Network, (b) Aggregate Models for TFM, (c) Relationship between weather, traffic and delay and (d) Optimization. Current approaches towards finding best solutions to these problems are discussed.

Biography

Banavar Sridhar is NASA Senior Scientist for Air Transportation Systems. His research interests are in the application of modeling and optimization techniques to aerospace systems. Dr. Sridhar received the 2004 IEEE Control System Technology Award for his contributions to the development of modeling and simulation techniques for multi-vehicle traffic networks and advanced air traffic system. He led the development of traffic flow management software, Future ATM Concepts Evaluation Tool (FACET), which received the NASA Software of the Year Award in 2006 and the AIAA Aerospace Software Engineering Award in 2009. He is a Fellow of the IEEE and the AIAA.