Special Session Proposal

- Title: Aviation Systems Intelligent Computational Models
- Modality: Full day
- Scope:

Air transport plays a key role in sustainable economic and social development. The aviation force in the global economic context can be confirmed by the fact that air traffic has doubled its volume every fifteen years since the mid-1970s, despite periods characterized by a severe recession. From a market perspective, aviation significantly influences macroeconomic indicators, contributing to the integration of communities and regions through clear cycles of investment and opportunity around the globe.

The economic importance of aviation can only be compared to its complexity. Moreover, airspace is a limited resource, and the systematic increase in aircraft flying without proper planning may cause safety issues, resulting in economic and human life losses. Therefore, accomplishing safe and sustainable Aviation development requires decentralized efforts of several heterogeneous and self-interested stakeholders.

Within this context, the ITSC 2023 Aviation Systems Intelligent Computational Models Special Session, as part of the International Research Network for Intelligent and Sustainable Aviation, would welcome intelligent modeling and simulation contributions aimed at the safe, secure, efficient, and sustainable development of the Air Navigation and Air Transportation, as well as at the improvement of any Aviation related decision-making processes. The aviation-dedicated session successfully happened in ITSC 2018 and ITSC 2019, and is planned to be open to the community.

Special topics and sub-topics of interest include (but are not limited to):

- Air Traffic Management Modeling, Simulation, and Decision-making support (Air Traffic Control; Air Traffic Flow Management; Airspace design, management, and capacity-complexity assessment; Unmanned Aircraft Systems (UAS) and drones' integration; spacecraft and balloons activities safe integration; conflict detection and resolution; trajectory prediction under uncertainty);
- Cybersecurity in the Aviation Domain;
Modeling and Simulation applied for Aviation Safety, Security, and Crisis Management;
IoT and 5G Applications within the Aviation System;
Human Factor and Human-Machine Interaction in the Aviation Domain;
Aviation and Climate Change;
System-Wide Information Management in the Context of Aviation;
Air Traffic Data Mining and Predictive Analytics;
Airport Facilities Design and Efficiency Assessment;
Autonomous Systems in the Aviation Domain (AI applications, learning frameworks, autonomous flying objects).

Proposers:

Antonio M. F. Crespo, PhD
Dr. Antonio Crespo holds a BSc in Aeronautical Sciences, a BSc in Social Sciences, an MSc in Computer Science, and a Ph.D. in Information and Systems Engineering. His professional career includes senior positions in government and industry ecosystems, and diplomatic assignments within the United Nations system. In his academic career, Dr. Crespo has been conducting AI-related research since 2003, which includes its applications to Electronic Warfare, Aviation, Environmental Sciences, and health & wellness. He is a member of the TransLab - Laboratory for the Research and Development of Computational Models applied to Air Transportation (University of Brasilia), associate editor of the IEEE Intelligent Transportation Systems Conference, Chair of the IEEE Education Society Montreal Chapter, and Director of the UNICA Community, Research and Learning Institute (UNICA CRLI). Throughout his career, Dr. Crespo actively worked to foster the integration among Academia, industry, and government. Additionally, Dr. Crespo served as an Air Force Pilot from 1993 till 2017, when he had the opportunity to fly a variety of aircraft, including combat models.

Li Weigang, PhD
Dr. Li Weigang is the coordinator of TransLab - Laboratory of Computational Model for Air Transportation in the Department of Computer Science of the University of Brasilia – UnB. He holds a Doctor of Science from Instituto Tecnológico de Aeronáutica (ITA) in 1994. He is also a researcher supported by Brazilian National Council for Scientific and Technological Development (CNPq).
He was the vice president of the Brazilian Air Transportation Research Society – SBTA (2006–2019) and was an associate editor of the IEEE Intelligent Transportation Systems Conference for many years. His main science contribution is the development of the "Once Learning" mechanism in Machine Learning. And his research interest is Artificial Intelligence and applications, especially in Air Traffic Management (ATM).

Alexandre de Barros Barreto, PhD
Dr. Alexandre Barreto holds a BSc in Aeronautical Sciences, an MSc and a Ph.D. in Computer Engineering. His professional career includes senior positions in the government and private sectors (utility industry, defense, and aviation). In his academic career, Dr. Barreto has been conducting cybersecurity-related research since 2003, which includes its applications to Aviation and Defense. He is a C4I & Cyber Affiliate Faculty at George Mason University (Virginia, USA), associate editor of the IEEE Intelligent Transportation Systems Conference.
Conference, reviewer for the journal, and Visiting Research of the UNICA Community, Research and Learning Institute (UNICA CRLI).

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