

38th DASC



Digital Avionics Systems Conference
San Diego, California, USA | September 8-12, 2019



CALL FOR PARTICIPATION

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The Boeing Company

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Dr. Krishna Sampigethaya
Embry-Riddle Aeronautical University--Prescott

Registration Chair

Ms. Ileana Canizares
Conference Catalysts

Important Dates

SUBMISSION DEADLINES

March 1, 2019
Abstract Submission

March 22, 2019
Notification of Acceptance

May 31, 2019
Full Paper Submission Deadline
for Peer Review

July 12, 2019
Final Paper Submission Deadline

CONFERENCE DATES

Hilton San Diego Resort & Spa

September 8-9, 2019
Tutorials

September 10-12, 2019
Conference

Please join us in sunny San Diego, California for the 38th AIAA/IEEE Digital Avionics Systems Conference (DASC), the preeminent R&D Conference in the field of digital avionics offered by its two most distinguished professional societies, the Digital Avionics Technical Committee (DATC) of the American Institute of Aeronautics and Astronautics (AIAA) and the Aerospace and Electronic Systems Society (AESS) of the Institute of Electrical and Electronics Engineers (IEEE).

In addition to having near perfect weather year-round, San Diego offers plenty of educational, cultural and recreational opportunities for everyone to explore around the conference. Venture out to Balboa Park for an evening enrichment, enjoy gaslight dinners at the historic downtown, winddown at the beaches along 70 miles of spectacular coastline or have a family outing at the world-famous zoo. We are positive that you will have a memorable and educational experience at the 38th DASC.

CONFERENCE THEME

UTM to ATM Airspace Integration – Role of Spectrum, AI, Machine Learning and Automation

Artificial Intelligence (AI) and machine learning are transformational for the commercial and the consumer industries. Drones and ground vehicles are relying more and more on sensor data fusion with AI to improve safety. The focus of the 38th DASC will be to explore how AI and machine learning can be applied effectively to various aspects of Air Traffic Management (ATM) to improve safety, capacity and performance. Participants are invited to submit cutting edge research papers and exchange diverse perspectives on application of AI and machine learning to address modern challenges of UAS integration into ATM airspace, dynamic spectrum operations, advanced CNS automation, cognitive pilot/controller interactions, cyber security, etc. Original research on technical challenges, gaps and approaches to enhance traditional ATM, UTM, CNS, IMA, space systems, software and human factors are invited.

Areas of emphasis will include:

- ATM/UTM decision-making using AI and machine learning.
- Urban Air Mobility (UAM) ATM concepts and CNS technology enablers
- Dynamic sectors and cognitive radio to reduce spectrum demand and improve operational efficiency.
- Adaptive, integrated secure networks – use of deep learning in cyber security
- Cognitive assistants, Digital Copilots and Robotic Copilot to reduce workload, augment performance and improve safety.
- Safety assurance and human factors.
- Integration of autonomous vehicles into the airspace.
- Multi-modal interaction including speech recognition and synthesis for cockpit and Air Traffic Management.
- Advancements in Avionics for Space Instruments
- Advancements in Avionics for Launch Vehicles and Space Craft

Other Topics

The 38th DASC will continue to offer opportunities to publish and present on a wide range of topics of interest to the avionics technology community (see next page).

Papers, Panels, Education and Workshops

The Technical and Professional Education Programs will incorporate technical research papers and relevant tutorials from international Researchers, Innovators, Engineers, Users, and Designers. Plenary panel discussions and keynote presentations by Leaders in Industry, Government and Academia will discuss topics that are shaping international developments. Please check our website for periodic updates: <http://www.dasconline.org>.



DASC 2019 TECHNICAL PROGRAM

Air Traffic Management (ATM) Machine Learning & Automation

Application of AI and machine learning to leverage distributed knowledgebase, fusion of sensor data from multiple airborne and ground systems to address ATM challenges; predictive automation aids to reduce controller and pilot workload.

ATM – Airspace & Spectrum management

Automation and cognitive radios to support dynamic sectors and mitigate escalating spectrum demand; Traffic flow management; spacing, sequencing, and scheduling; command and control technologies for future ATM; separation management; unmanned aircraft system traffic management (UTM) inspired air traffic management for new entrants; simulation and modeling needs.

Unmanned Aircraft Systems (UAS)

Issues, challenges, and opportunities arising from emerging drone and autonomy technology developments; UAS system design, applications, and mission optimization. Of significant interest are concepts for integrating UAS into both controlled and uncontrolled airspace.

Communications, Navigation, and Surveillance and Information Networks (CNS)

Role of machine learning and AI in navigation, and surveillance; distributed knowledgebase enabled by broadband communications; on-board and ground-based CNS systems for all vehicles and services. Emerging fields include: surface wireless networks; air/ground datalink; satellite-based CNS; optical communications; global navigation satellite systems (GNSS); alternative positioning navigation and timing (APNT); performance-based navigation; and, surveillance systems for ATM and collision avoidance; self-forming / healing networks; quality of service (QoS) driven software defined networks.

Cyber, Systems, and Software (CSS) Impact of “Connected”

Design, testing, verification and validation, and certification of large complex aviation systems with multiple design assurance levels; avionics cyber security; cyber-physical security threat assessment and mitigation development; airborne network security and risk; software assurance versus regular security patches. Multiple Independent Levels of security safety (MILS); physical and virtual system firewalls; AI-based deep packet inspection; data security for shared data buses; operating system security; virtual versus physical domain separation.

Integrated Modular Avionics (IMA)

System resources and performance allocation, configuration, integration, verification and certification processes and tools; model-based system engineering; scalability; inter-partition interference on multicore processors; assessing system demand and resource availability; mitigation of common mode failures; system maintenance; wired and wireless communication; health monitoring; optimization techniques; architectures including open interface standards; operating systems; ARINC-653; alternate API solutions, communication standards, use of Commercial-Off-The-Shelf (COTS) technologies; modularity vs. scalability.

Human Factors (HF)

Issues on human interaction with automation such as mode awareness, trust in automation, roles and responsibilities, flight deck displays and controls, and decision support tools; assessment and modeling of human performance; methods for avoiding the presentation of hazardously misleading information; information abstraction and conveyance concepts that enable appropriate levels of workload and crew coordination.

Special Topics (ST)

Includes topics that do not fit the above areas or are recently emerging from new technical innovations, such as but not limited to: emerging systems architectures; safety-critical avionics; mission planning, and operations; risk management methods; computer aided design; space systems.

PROFESSIONAL EDUCATION

DASC will offer two days of Professional Education sessions spanning relevant engineering disciplines. These tutorials will be presented by educators and practicing professionals who are recognized experts in their field.

Examples of possible topics include:

- Basic & Advanced Avionics Systems; Integrated Modular Avionics
- Surveillance & Collision Avoidance; Synthetic Vision; Sensing Modalities
- Navigation Systems Including Technologies and Performance Based Navigation
- Communications Systems and Networks
- Systems Engineering; Program Management
- Software Development & Test Certification (DO-178)
- Environmental Qualification (DO-160)
- System Safety
- Cyber Security
- Autonomy & Application of Modern Techniques to Autonomous Systems

All professional education sessions will offer Continuing Education Units (CEUs) through the IEEE. For more information, contact our Professional Education Chair.

SPONSORS AND EXHIBITS

This year's conference will feature exhibits and product demonstrations by representatives of key avionics-related industries and institutions. To have your organization represented in our exhibit hall, please contact our Sponsors and Exhibits Chair via the conference website.

For inquiries regarding paper submissions, please contact:

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