DASC 39th
Digital Avionics Systems Conference
San Antonio, Texas, USA – October 11-15, 2020

CALL FOR PAPERS

General Chair
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Honeywell Aerospace

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Iowa State University

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ATS Solutions

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Southwest Research Institute

Student Research Competition Chair
Dr. Giancarmine Fasano
University of Naples

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

Publicity Chair
Ms. Denise Ponchak
NASA Glenn Research Center

Conference Manager
Ms. Laura LeBlanc
Conference Catalysts, LLC.

IMPORTANT DATES

Submission Deadlines
Late abstracts will be accepted on a case-by-case basis.

March 6, 2020
Abstract Submission

March 27, 2020
Notification of Acceptance

May 22, 2020
Full Paper Submission
(If Editorial Review is Requested)

July 17, 2020
Final Paper Submission Deadline

Conference Dates

October 11-12, 2020
Tutorials

October 13-15, 2020
Conference

The 39th Digital Avionics Systems Conference (DASC) promises to continue its rich tradition as the preeminent R&D Conference in the field of digital avionics offered.

In addition to the increasingly diverse background of attendees and relevant technical topics discussed, the conference offers a conducive environment for educational and recreational opportunities for everyone to explore. We are positive that you will have a memorable and educational experience at the 39th DASC.

CONFERENCE THEME

Certifiable and Secure Artificial Intelligence in Safety-Critical Air Transportation Systems.

The application of Artificial Intelligence (AI) in aviation will have an unprecedented transformational impact. However, despite advances in robust, high performance AI with new capabilities, application to safety-critical air transportation systems presents unique challenges. Associated risks, challenges and certification requirements of aeronautical systems implementing AI-technologies need to be well understood and addressed. The 39th DASC will explore critical-to-quality essentials for AI systems in safety-critical air transportation systems. Conference participants are invited to submit cutting edge research papers and exchange diverse perspectives on application of certifiable and secure AI in the air transport system considering the safety-criticality of the domain. Original research on technical challenges, gaps and approaches to enhance traditional ATM, UTM, CNS, IMA, space systems, software and human factors are also invited.

Areas of emphasis will include:

» Explainable artificial intelligence for decision-making.

» AI use cases, concepts and technology enablers for air transport systems.

» Validation, verification and certification.

» Adaptive, integrated secure networks – use of deep learning in cyber security.

» Safety assurance and human factors.

» Integration of autonomous vehicles into the airspace.

» AI-driven Cognitive assistants, Digital Copilots and Robotic Copilot to reduce workload, augment performance and improve safety.

» Multi-modal interaction including speech recognition and synthesis for cockpit and Air Traffic Management.

Other Topics

The 39th 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: **www.dasconline.org**.

Co-sponsor

DATC — AIAA Digital Avionics Technical Committee

IEEE — Advancing Technology for Humanity

AESS

AIAA — The World's Forum for Aerospace Leadership

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)

Developing AI behavior that is unambiguous or predictable to human operators and demonstration that such systems meet their intended function in all foreseeable operating conditions. 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; and methods for avoiding the presentation of hazardously misleading information.

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 Tutorial 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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