37th DASC
Digital Avionics Systems Conference
London, England, UK / September 23-27, 2018

CALL FOR PARTICIPATION

Technical Papers, Tutorials, & Exhibits

Intelligent Automation and Autonomy for a safe and secure Air Transport System

IMPORTANT DATES

- **Abstract Submission**
  March 16, 2018
- **Full Paper Submission Deadline**
  (If Editorial Review is requested)
  May 31, 2018
- **Full Paper Submission Deadline**
  (For Award Eligibility)
  July 27, 2018
- **Full Paper Submission Deadline**
  (Non Award Eligible)
  August 6, 2018

CONFERENCE DATES

- **Tutorials**
  Imperial College
  September 23-24, 2018
- **Conference**
  Hotel Ibis London Earl's Court
  September 25-27, 2018

ORGANIZERS

General Chair – Ms. Denise Ponchak, NASA Glenn Research Center

Intl Co-Chair – Dr. Pavel Paces, Czech Technical University

Tech Program Chair – Dr. Emmanuel Letsu-Dake, Honeywell Aerospace

Finance Chair – Mr. George N. Andrew, GNA Aerospace Consulting Group

Sponsors & Exhibitors Chair – Mr. Paul Kostek, IEEE AESS

Local Arrangements Chair – Dr. Hugh Griffiths, University College London

Awards Chair – Mr. Chris Watkins, Gulfstream Aerospace Corporation

Tutorial Chair – Dr. Billy Barott, Embry-Riddle Aeronautical University

Conference Support – Ms. Casey Henshaw, Conference Catalysts

Publicity Chair – Dr. Kathleen Kramer, University of San Diego

Please visit
2018.dasconline.org

Join us in London for the 37th AIAA/IEEE Digital Avionics Systems Conference (DASC), the preeminent R&D Conference in the field of digital avionics offered by the two most distinguished professional societies, the American Institute of Aeronautics and Astronautics (AIAA) and the Institute of Electrical and Electronics Engineers (IEEE).

Besides being the location of the 37th DASC, London also boasts one of the greatest concentrations of cultural attractions in the world. From Royal Palaces to Parliament and Big Ben, from Roman ruins to Castles and Cathedrals, you could spend endless days exploring London.

CONFERENCE THEME

Intelligent Automation and Autonomy for a safe and secure Air Transport System

Intelligent systems are being rapidly developed in many domains but their introduction into the air transport system is coming at a slower pace due to safety and criticality concerns. To date, most of the autonomy and automation innovation in aviation has focused on control of the airplane or its systems. Things will get very interesting when it is applied to real decision-making tasks. For this type of work, machine learning is often paired with deep learning and neural networks to create powerful algorithms that attempt to "think" like a human. Participants will exchange diverse perspectives on advancements in automation and autonomy research including technical challenges, gaps and approaches.

The conference will review underlying capabilities, dependencies and implementations of intelligent systems in aerospace to better understand opportunities and issues towards realizing their full potential capabilities. The AIAA has an overarching document titled "Roadmap for Intelligent Systems in Aerospace" (http://tinyurl.com/AIAA-ISRoadmap-v1-0) which is a useful primer for background information, precipitation of ideas and a precursor to expected dialog at the conference.

Areas of emphasis will include:

- **Air Traffic Management decision-making (NextGen/SESAR).**
- **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.**
- **Cognitive assistants, Digital Copilots and Robotic Copilot to reduce pilot workload, augment performance and improve safety.**
- **Product assurance, Regulation and Certification of non-deterministic systems**
- **Adaptive, integrated secure networks.**

Other Topics: The 37th 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 periodic updates: http://2018.dasconline.org.

AIAA The World's Forum for Aerospace Leadership
IEEE Advancing Technology for Humanity
DATC AIAA Digital Avionics Technical Committee
AESS

TECHNICAL PROGRAM

Air Traffic Management (ATM)

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.

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; and, information abstraction and conveyance concepts that enable appropriate levels of workload and crew coordination.

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)

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. Information Networks topics including; self-forming/healing networks; quality of service (QoS); data buses; intra-processor and inter-process communications; data partitioning; protocols; multi-protocol gateways; and message routing.

Cyber, Systems, and Software (CSS)

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. Multiple Independent Levels of security, safety (MILS), physical and virtual system firewalls, data security for shared data buses, operating system security, information monitoring and quality assurance, information management.

Integrated Modular Avionics (IMA)

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

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; and machine learning applications.

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; Space Systems; 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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