

Submission Guidelines

Please submit full draft papers or extended abstracts with a minimum of 1000 words by the June submission deadline using the “Submit a Paper” link at <https://scitech.aiaa.org/>. All abstracts will be reviewed by qualified individuals from industry, academia or government and reviewer comments will be returned to the authors. The Software TC is emphasizing this extra review step to improve its review process ensuring high-quality papers.

Proposals for Special Topic Sessions, Panel Discussions

Proposals for special sessions or panel discussions on other important and emerging topics of interest are also welcome. Please see <http://www.aiaa-scitech.org> for instructions on proposing special topic sessions. Email jim.murphy@nasa.gov to propose panel discussions.

Software Topic Areas of Interest

Papers are sought in the area of software and software-intensive systems. We are soliciting papers for three main topics. Topics include, but are not limited to the corresponding listed items.

Software Modeling and Architecture:

Papers are sought in the area of software architecture for aerospace systems. Specific areas of interest include, but are not limited to:

- Open architectures
- Failsafe architectures
- Commercial off the shelf software (COTS)
- Verification and validation as well as certification considerations for software
- Software reuse in practice
- Modeling of software architecture
- Role of architecture within verification
- New concepts in software architecture
- Architectural definition

Assurance of Autonomy:

Papers are sought that:

- Categorize machine learning algorithms according to their ability to be bounded or otherwise assured
- Describe architectures in which the overall behaviors of machine-learning enabled components can be assured
- Describe argumentation frameworks in which systems that contain machine-learning enabled components can be assured and certified

Software Challenges in Aerospace:

We will bring together experts at the intersection of aerospace and computer science. We will focus on software for flight operations (both on the vehicle and ground) and place a priority on the design and analysis of software-intensive aerospace systems for safety assurance. The goal of

these sessions is to foster innovation and discussion across the divide between the two academic communities. We place an emphasis on demonstrable research on real-world applications, with clear extensions to aerospace software. Sessions will specifically target high-quality papers with a high degree of formality for software modeling and analysis. We invite full, draft papers of the following types:

- Papers that clearly describe gaps in the capabilities or policies related to aerospace software, and that illuminate frontiers where research will be necessary in order to make progress.
- Papers which push the boundaries and deliver results in software intensive systems, highlighting techniques that enable the intelligent and efficient management of system complexity.

The topics covered by this workshop include the following:

Software Synthesis for Aerospace

- Model-based approaches to software and software-intensive system design
- Compositional and hierarchical design approaches for reducing and managing complexity
- Approaches to building intelligent and adaptive systems within a safety- critical framework
- The generation of code that is correct-by-construction
- The design of maintainable systems

Software Analysis for Aerospace

- Verification and validation for safety-critical software systems
- Security analysis for aerospace communications
- Compositional analysis of code for scalability
- Model-based Testing, Formal Methods, Run-Time Monitoring
- Statistical techniques (including data mining and learning) for program and software behavior analysis

Aerospace System Integration

- Architectures for safety-critical aerospace systems containing software, hardware and people
- Approaches to, benefits of, and limitations of Integrated Modular Avionics frameworks
- Approaches to, benefits of, and limitations of service-oriented architectures
- Human-computer interaction including intelligent cockpits/control towers
- Adaptive airspace implementations Aerospace Software Policy and Implementation
- The certification of software systems, including DO-178, DO-278, and safety-case based approaches
- Decision-making in air systems, including both autonomy and human factors issues
- Creating and maintaining a skilled workforce for aerospace software