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Modeling and Simulation Technologies Call for Papers

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Abstract Submission Guidelines

Prospective authors are asked to submit their work electronically through the AIAA AVIATION website prior to the published deadline (<https://aviation.aiaa.org>). Authors may submit either an extended abstract of 1,000 words, or a draft of the paper itself, if available. Draft papers must include a 100- to 200-word abstract.

The manuscript, whether an extended abstract or draft paper, must include a discussion on the background and motivation for the work, as well as an explanation of the paper's main contributions to the particular area(s) of interest, including examples of results. The inclusion of the paper in the conference will depend solely on the quality and detail of the submitted manuscript.

Each submission will be reviewed by at least three members of the Modeling and Simulation Technical Committee. Authors submitting extended abstracts are encouraged to include as many details about their work as possible to help reviewers make informed evaluations.

At each conference, members of the Modeling and Simulation Technical Committee sit in the audience and judge all presentations as the first step of their selection of a best paper at the conference. The papers associated with the best presentations in each session will be evaluated further. The best overall paper will be awarded at the conference the following year and winners receive a cash award.

Topic Areas of Interest

Authors are invited to submit technical papers which address topics either directly in or in support of modeling and simulation, particularly related to flight simulator technologies, including:

Modeling and Simulation of Air and Space Vehicle Dynamics, Systems, and Environments

Papers are sought that describe the modeling and real-time simulation of vehicle dynamics and vehicle systems, and the environments in which they operate. This includes, but is not limited to, fixed wing aircraft, rotorcraft, uninhabited aerial systems and spacecraft. Non-real-time simulations will also be considered providing the work is in support of real-time simulation.

Design and Development of Simulations, including Human-in-the-Loop Simulations, of New Entrants

Papers are sought on simulations, including human-in-the-loop simulations, that incorporate new entrants, such as uninhabited aerial systems (UAS), urban air mobility (UAM) vehicles, commercial space launch systems, small to larger

drones, etc. The variety of new vehicle concepts are ever increasing as are the missions they are intended to perform, which presents a number of new challenges to the field of simulation. Papers are sought on novel simulation techniques and technologies for new entrant development, operator training, and demonstration of operational concepts, etc.

Human-in-the-Loop Simulation of Air Traffic Management

Papers are sought that describe the use of human-in-the-loop simulations in air traffic management concept development, testing, and analysis. Topics of interest include, but are not limited to, simulation studies that investigate air traffic management automation concepts and decision support tools, airspace and airport traffic modeling methods, and model validation and verification experiences and methods.

Multi-disciplinary Modeling and Simulation Across Domains

Multi-disciplinary modeling and simulation that spans across domains is increasingly popular. Papers are sought in the area of novel modeling and simulation approaches across domains such as structural dynamics, flight mechanics, and aerodynamics. There is a strong preference for papers which demonstrate integration with real-time, real-time capable or human-in-the-loop vehicle simulations.

Design, Development, Testing, and Validation of Human-in-the-Loop Simulations

Papers are sought on the design, development, testing, and validation of human-in-the-loop simulations. Papers are encouraged that discuss novel tools, techniques, and methodologies that decrease the development time or increase the capabilities of human-in-the-loop or real-time simulations, and the quality of models. Papers that address testing and validation methodologies for flight simulators, or discuss regulatory issues and experiences are of particular interest.

Model and Simulation Integration

Papers are sought that discuss model and simulation integration. Of particular interest are papers discussing the integration of commercial off-the-shelf tools into existing simulation development and execution processes. Application of networked/distributed simulations and the development of standards that facilitate interaction of diverse simulation environments are encouraged.

Motion Systems, Visual Systems, and Image Generation

Papers are sought involving all aspects in the design, development, and use of motion systems, visual systems, and image generation. Papers that discuss novel motion configurations and hardware as well as the application of motion for research and training are highly encouraged. Papers on motion and visual system technologies that improve simulation fidelity and effectiveness are also highly encouraged.

Human Factors, Perception, and Cueing

Papers are sought in the broad area of human factors, perception, and cueing systems. Of particular interest are the human perception of the essential cues in flight and the reproduction of these cues in a simulator. A related topic is the application of existing knowledge on perception and cueing for understanding and measuring simulation fidelity. Papers on human factors related to the pilot-vehicle interface and human operator modeling are also encouraged.

Model-Based Design and Hardware-in-the-Loop Simulation

Model-based development is an emerging approach to engineering that positions models as the core assets of systems development. Papers are sought that describe novel approaches and new tools in model-based development in the aerospace field. Furthermore, papers are sought on the development and use of model-in-the-loop, software-in-the-loop, processor-in-the-loop and hardware-in-the-loop simulations. Topics of interest span from model or software in the loop simulation development to system integration laboratories for hardware-in-the-loop testing of modern fly-by-wire systems, integration and testing of modern avionics and synthetic vision systems, and autonomous flight systems integration and testing.

Data Analysis Techniques Applied to Simulation

Papers are sought on novel data processing and visualization techniques applied to (human-in-the-loop) simulations. Papers on novel methods to model human performance and behavior, and new pilot training evaluation techniques are of special interest.