

# Software

Papers Presented at the AIAA SCITECH 2026 Forum

Orlando, Florida, USA  
12 - 16 January 2026

ISBN: 979-8-3313-3517-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uwytkug'Xcmg{'Ftkxg.'Uwky'422, Reston, VA 20191, USA.

## TABLE OF CONTENTS

Mixed-Reality Simulation for Testing Complex UAS Missions in Safe Environments .....	1
<i>Thorben Bornscheuer, Lars Leferenz, Rebecca Schmidt, Joachim Rüter</i>	
Evaluation of Methods for Distance Estimation to an Aerial Coupling Device using a Single RGB Image.....	20
<i>Joachim Rüter, Philipp Davydov, Umut Durak, Johann C. Dauer</i>	
QuickSAT/Test (QS_TEST), a Framework for Automated Testing, and Support for Validation and Verification With Artifact Tracking for Autonomous and Complex Systems .....	37
<i>Andrew D. Santangelo</i>	
Automated Scenario Generation to Maximize Coverage of an Operational Design Domain for AI-Based Aviation Systems.....	46
<i>Siddhartha Gupta, Marlène Nana Mbouendeu, Lionce Vadece Kamdem Kountchou, Umut Durak</i>	
Data-Driven Aviation Scenario Generation using Generative Adversarial Networks .....	57
<i>Mhd Saied Jedeni, Siddhartha Gupta, Umut Durak</i>	
Context-Aware Input Selection Using Operational Design Domain .....	69
<i>Christoph Torens, Sebastian Schirmer, Umut Durak</i>	
Quantum Computer Programming Languages for Aerospace Applications .....	78
<i>Fred C. Briggs</i>	
Implementing the Koopman-von Neumann Approach on Continuous-Variable Photonic Quantum Computers .....	93
<i>Xinfeng Gao, Olivier Pfister, Stefan Bekiranov</i>	
Accelerating Insertion of Capability using GenAI based Control Synthesis from Video .....	102
<i>Bjorn Andersson, Dionisio de Niz</i>	
Context-Based and Event-Driven Multi-Agent Architectures for Large Language Model Assistants in Engineering Environments .....	107
<i>Stanislaus Reitenbach, Martin Siggel, Martin Bolemant</i>	
RISC-V Soft-IP Cores for Custom Avionics System Design.....	119
<i>Phillip Noeldeke, Tobias Winkler, Alexej Dikarew-Martini, Umut Durak, Gia Bao Thieu, Jasper Homann, Guillermo Payá Vayá</i>	
Implementing Rust Language Algorithms for Image Processing .....	131
<i>Eric Lam, Christopher Leung, Isaam Khan, Hanh Nguyen, John Teano, Nelly Dzul Chi</i>	
Investigating Requirements-Based Test Case Generation With LLMs in Aerospace Applications .....	142
<i>Kendall Mendez, Jose Lopez</i>	
Atmospheric Visibility Estimation From Photographs via Large Language Models, or Can ChatGPT Tell the Weather? .....	165
<i>Chad Mourning, Godha Naravara</i>	
Prediction of Performance Degradation in Safety-Critical Flight Software Using NASA SimuPy-Flight and Random Forest .....	179
<i>Vishnupriya S Devarajulu, Austin W. Lindquist</i>	

Serverless Avionics: A new Architectural Approach ..... 192  
*Bojan Lukić, Tim Schubert, Sven Friedrich, Cem Önem, Janick Beck, Nora Breitmoser-  
Widdecke, Alexander Ahlbrecht, Wanja Zaeske, Umut Durak, Harro von Viebahn*

**Author Index**