Iris Groher, Thomas Vogel (Hrsg.): Software Engineering 2023 Workshops,
116 Digital Library, Gesellschaft für Informatik, 2023

5th Workshop on Avionics Systems and Software Engineering (AvioSE'23)

Bjoern Annighoefer[1], Andreas Schweiger[2], Stéphane Poulaine[3]

Abstract: Systems and software engineering in aerospace is subject to special challenges. For their resolution the AvioSE'23 workshop connects academia and industry with selected scientific presentations of high quality, motivating keynote talks, and an interactive panel discussion.

Keywords: avionics; systems engineering; software engineering; formal method; model-based; requirement; qualification; certification; simulation; process; tool; platform; architecture; AI

1 Scope and History

Considerable advances for aerospace applications are expected with the introduction of new technologies. However, aerospace requirements do not allow the application of these straight away due to regulations and certification. Technologies and methods need to be amended or extended for meeting these. The resulting challenges are addressed in the workshop.

The AvioSE'19[4] edition dealt with general issues and AvioSE'20[5] addressed development tools. AvioSE'21[6] tackled topics for the deployment of AI to avionics. AvioSE'22[7] handled safe and secure avionics architectures (e.g. Integrated Modular Avionics, platforms, multi-core, networks, clouds, middleware).

[1] University of Stuttgart, Institute of Aircraft Systems (ILS), Germany, bjoern.annighoefer@ils.uni-stuttgart.de.
[2] Airbus Defence and Space GmbH, Manching, Germany, andreas.schweiger@airbus.com.
[3] Airbus Operations GmbH, Hamburg, Germany, stephane.poulaine@airbus.com.
[4] Annighoefer et al., 1st Workshop on Avionics Systems and Software Engineering (AvioSE'19), 2019. Annighoefer et al.; Challenges and Ways Forward for Avionics Platforms and their Development in 2019, in IEEE/AIAA 38th Digital Avionics Systems Conference (DASC), 2019.
[5] Annighoefer et al., 2nd Workshop on Avionics Systems and Software Engineering (AvioSE'20).
[6] Annighoefer et al., 3rd Workshop on Avionics Systems and Software Engineering (AvioSE'21); A. Schweiger et al., Classification for Avionics Capabilities Enabled by Artificial Intelligence, IEEE/AIAA 40th Digital Avionics Systems Conference (DASC), 2021.
[7] Annighoefer et al., 4th Workshop on Avionics Systems and Software Engineering (AvioSE'22); B. Annighoefer et al., Domain-specific Drivers and Limits for Avionics Architectures — A Critical Review in the Context of the Avionics Application Domains, IEEE/AIAA 41st Digital Avionics Systems Conference (DASC), 2022.

doi:10.18420/se2023-ws-13

2 Workshop Objectives

The workshop accelerates the bidirectional transfer of knowledge between academia and industry. It provides a platform for researchers to present new methods, tools, and technologies from avionics systems and software engineering, e.g. model-based development, model-based methods, requirements engineering, formal methods, and virtual methods. These contributions are presented in a scientific format, but the small character of the workshop allows in-depth discussions. This in turn increases the precision and future adjustment of the works. Thus, the workshop provides the enabling platform for the stakeholders to discuss technical, but also process, and educational topics. Further, the forum offers the forming of research consortia, once specific issues have been identified, for which project partners share their research competence.

AvioSE'23 motivates researchers through keynote talks by three invited speakers. The keynotes highlight a dedicated topic, summarize its state-of-the-art, and emphasize urgent challenges.

A current topic is selected and addressed interactively by inviting all participants to discuss aspects and needs of modern avionics. We are connecting academics and professionals in a panel discussion with invited experts from academia, industry, and authorities. The expected outcome is the identification of current and future challenges as well as ideas on how to address these. The panel members' statements can be challenged by the audience. Major conclusions of the panel discussion are made available on a virtual platform.

Acknowledgements

Many people contributed to the success of this workshop. First of all, we want to give thanks to the authors of the accepted papers. Second, high appreciation goes to our keynote speakers. Third, sincere thanks are directed to the panelists for sharing their knowledge and their willingness to answer the questions. Fourth, we want to express our gratitude to the SE 2023 organizers for supporting and hosting our workshop. Finally, we are thankful for the contributions of the program committee's members for soliciting papers and writing peer reviews: Björn Annighöfer (University of Stuttgart), Jürgen Becker (KIT), Steffen Becker (University of Stuttgart), Stefan Brunthaler (Universität der Bundeswehr München) Umut Durak (DLR Braunschweig), Rolf Büse (Diehl Aerospace GmbH), Holger Flühr (FH Johanneum Graz), Ralf God (Hamburg University of Technology), Lars Grunske (Humboldt-Universität zu Berlin), Christian Heinzemann (Robert Bosch GmbH), Wolfgang Hommel (Universität der Bundeswehr München), Eric Knauss (University of Gothenburg), Winfried Lohmiller (Airbus Defence and Space GmbH), Christian Meißner (Volkswagen AG), Alexander Pretschner (Munich University of Technology), Stephan Rudolph (Northrop Grumman LITEF GmbH), Bernhard Rumpe (RWTH Aachen University), Andreas Schweiger (Airbus Defence and Space GmbH), Steven VanderLeest (RAPITA Systems), and Sebastian Voss (Aachen University of Applied Sciences).