

16th NASA Formal Methods Symposium
 NASA Ames Research Center, Moffett Field, California June 4 – 6, 2024
<https://conf.researchr.org/home/nfm-2024>

Call for Papers

Theme of the Symposium

The widespread use and increasing complexity of mission-critical and safety-critical systems at NASA and in the aerospace industry requires advanced technologies to address their specification, design, verification, validation, and certification processes. For example, there is an increasing need for autonomous systems in deep space missions including NASA's Moon to Mars exploration plans. The NASA Formal Methods Symposium is a forum to foster collaboration between theoreticians and practitioners from NASA, other government agencies, academia, and industry, with the goal of identifying challenges and providing solutions towards achieving assurance for such critical systems. The focus of this symposium is on formal techniques for software and system assurance for applications in space, aviation, robotics, and other NASA-relevant safety-critical systems. This year's symposium extends the focus to safety assurance of machine learning (ML) enabled autonomous systems, formal methods for digital transformation, and accessibility for new industries.

Topics of Interest

<p style="text-align: center;">Advances in Formal Methods</p> <p>Formal verification, model checking, and static analysis; interactive and automated theorem proving; program and specification synthesis, code transformation and generation; run-time verification and test case generation; techniques and algorithms for scaling formal methods; design for verification and correct-by-design techniques; requirements generation, specification, and validation</p>	<p style="text-align: center;">Integration of Formal Methods</p> <p>Use of ML techniques in formal methods; integration of formal methods and software engineering; integration of diverse formal methods techniques; combination of formal methods with simulation and analysis techniques</p>	<p style="text-align: center;">Formal Methods in Practice</p> <p>Experience reports of application of formal methods in industry; use of formal methods in education; applications of formal methods in concurrent and distributed systems, fault-detection, diagnostics, and prognostics systems, human-machine interaction analysis</p>
<p style="text-align: center;">Safety Assurance of Autonomous Systems</p> <p>Verification of ML enabled systems; runtime monitoring or model checking to ensure safe operation; formal specifications and modeling of ML enabled systems; case-studies/experience reports exploring the application of formal methods in autonomous safety-critical, cyber-physical and hybrid systems; using formal evidence for certification of ML enabled systems</p>	<p style="text-align: center;">Formal Methods for Digital Transformation</p> <p>Applications related to Digital Twin & Digital Thread; verification for integrated design and manufacturing; AI digital assistants for system design; runtime monitoring for Smart Campus & Smart Cities</p>	<p style="text-align: center;">Accessibility of Formal Methods for New Industries</p> <p>"New Space" markets; Advanced Air Mobility and Startup Aviation; Formal Methods as a Service</p>

Submission

There are two categories of submissions:

Regular Papers

15 pages including references, describing fully developed work and complete results.

Short Papers

6 pages including references, in one of the categories below: tool papers describing novel and publicly available tools, case studies detailing applications of formal methods, and new emerging ideas in the topics of interest.

All papers should be in English and describe original work that has not been published or submitted elsewhere. NFM24 will be a hybrid conference. Authors of accepted papers are encouraged to present their work in person at the conference. There will be a tool demonstration session at the conference, where tool developers get to showcase their tools interactively with the attendees. Authors of all tool papers, under the short papers category, are required to participate in the tool demonstration session. Authors of regular papers are also welcome to participate in the tool demonstration session to showcase their application. All submitters who are interested in participating in the tool demonstration session must include an additional appendix (maximum 4 pages and will not appear in the proceedings) containing the description of the proposed demo and the URL to a screencast demonstrating the tool. Authors of all accepted papers additionally have an opportunity to present a poster.

NFM prohibits the use of generative AI to create the textual narrative of the paper. However, the use of generative AI to create examples (such as text, tables, graphics, and code) that support the paper is permitted, but this must be disclosed in the paper. Basic word processing systems that recommend and insert replacement text, perform spelling or grammar checks and corrections, or systems that do language translations need not be disclosed in the paper.

All submissions will be fully reviewed by members of the Program Committee. Accepted regular and short papers will be published in the Formal Methods subline of Springer's Lecture Notes in Computer Science (LNCS) and must use LNCS style formatting (<https://www.springer.com/gp/computer-science/lncs/conference-proceedings-guidelines>). Papers must be submitted in PDF format at the EasyChair submission site, <https://easychair.org/conferences/?conf=nfm2024>.

Important Dates

- Abstract submission**
December 1, 2023
- Full paper submission**
December 8, 2023
- Notification**
February 16, 2024
- Final version**
March 15, 2024
- Conference**
June 4-6, 2024

Information

Hybrid conference. Speakers and presenters are encouraged to be in person. Located at Moffett Field, California (Building #3 NASA Research Park).

There will be no registration fee for participants. All interested individuals, including non-US citizens, are welcome to attend, listen to the talks, and participate in discussions; however, all attendees must register.

Organizing Chairs

Nathan Benz
 Divya Gopinath
 Nija Shi

Contact

nfm24-
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