

Call for Papers: 3rd International Workshop on Trustworthy Autonomous Cyber-Physical Systems (TACPS)

We cordially invite submissions for the upcoming 3rd *International Workshop on Trustworthy Autonomous Cyber-Physical Systems (TACPS)*, which explores the intersection of artificial intelligence, safety, security, testing, and verification in autonomous cyber-physical systems. This workshop will focus on **neurosymbolic methods** and **foundation models** to address the challenges of testing, verifying, and deploying autonomous systems in critical environments. Their typical examples include autonomous vehicles, aerial drones, and industrial control systems.

The workshop will be held on July 21, 2025. It will be co-located with the 37th International Conference on Computer-Aided Verification (CAV) in Zagreb, Croatia.

Our primary goal is to facilitate meaningful discussions and idea exchanges between workshop paper authors and our world-leading TPC members. We accept the following three paper categories, which will not be considered official, formal publications. Each submission will undergo the same rigorous review process by our TPC. This approach allows authors to further refine or submit their work to other top-tier venues.

Accepted workshop papers will be hosted on Arxiv and shared with a broader audience through our TACPS community, with the potential to be invited for follow-up discussions at Shonan and Dagstuhl seminars in 2026.

Paper Categories:

1. **Vision Papers** (4 pages, plus 1 page for references)

Vision papers should present innovative and groundbreaking ideas supported by promising initial results or speculative visions about the future of autonomous CPS. Submissions should provide well-motivated arguments and strong scientific intuition, laying the groundwork for future research directions in neurosymbolic methods and foundation models for autonomous systems. We particularly encourage the discussion of how formal methods will contribute to these directions.

2. **Research Papers** (8 pages, plus 2 pages for references)

Research papers should describe original, unpublished theoretical, empirical, conceptual, or experimental research related to neurosymbolic approaches and foundation models applied to autonomous CPS. Papers should present novel contributions to the fields of verification, safety, and testing of autonomous systems using these advanced techniques. Survey papers on relevant topics are also welcome under this category.

3. **Experience Papers** (8 pages, plus 2 pages for references)

Experience papers should focus on the practical application and implementation aspects of neurosymbolic and foundation model-based approaches in autonomous CPS. These papers should detail real-world use cases, system integration challenges, and insights from deploying these techniques in practice.

Topics of Interest (including but not limited to):

- **Neurosymbolic Reasoning, Learning, and Verification for Autonomous CPS**
 - Integration of symbolic reasoning with machine learning models for decision-making and learning in autonomous systems.

- Case studies of neurosymbolic reasoning in real-world autonomous CPS applications.
 - Formal safety and correctness verification techniques for neurosymbolic models and their application in ensuring the safety of autonomous systems.
- **Program Synthesis for Autonomous CPS**
 - Techniques for automatically synthesizing programs (e.g., type-directed synthesis) for autonomous systems using formal typing systems.
 - Program synthesis methods that combine symbolic and neural components to ensure correctness and safety in autonomous CPS.
- Methods for transforming and synthesizing code to improve the performance, reliability, and safety of autonomous systems.
 - Using synthesis to adapt code based on changing environments and scenarios.
- **Foundation Models-Based Test Generation for Autonomous CPS**
 - Leveraging large-scale foundation models to generate effective test cases for autonomous CPS.
 - Applying foundation models for fault detection and robustness testing in real-world environments.
- **Neurosymbolic Reinforcement Learning for Autonomous CPS**
 - Integrating neurosymbolic methods with reinforcement learning to improve decision-making in autonomous systems.
 - The role of neurosymbolic approaches in reinforcement learning-based autonomous systems, focusing on real-time safety and adaptability.
- **Surveys of Neurosymbolic and Foundation Models for Autonomous CPS**
 - Comprehensive surveys of current research on neurosymbolic methods and foundation models applied to autonomous CPS. Such surveys fall under the Research Papers category.
 - Review and comparison of existing techniques and their potential to advance autonomous systems' reliability, safety, and trustworthiness.
- **Formal Methods for Trustworthy Autonomous CPS**
 - Use of formal methods (satisfiability solving, model checking, reachability verification, theorem proving, and other techniques) for proving the correctness, safety, and other trustworthiness aspects of autonomous CPS.
 - The application of formal verification to the development and deployment of neurosymbolic systems and foundation models in autonomous CPS.

Submission Details:

- **Paper Format:** Submissions must follow the ACM conference style and all authors should use the official "ACM Primary Article Template", as can be obtained from [the ACM Proceedings Template page](#).
 - Microsoft Word users: please still use the "Interim Template" and not the New Workflow for ACM Publications. This should result in a two-column format.
 - LaTeX users: please refer to the sample-sigconf.tex example file in the template available on [the ACM Proceedings Template page](#).

- **Submission Link:** Papers must be submitted through the Easychair system:
<https://easychair.org/conferences/?conf=tacps25>
- **Review Process:** Submissions will undergo a single-blind review process, and all accepted papers will be published in an Arxiv proceedings volume.
- **Deadlines:**
 - All paper submissions are due by **March 31, 2025** (anywhere on Earth)
 - Notifications will be sent by **April 30, 2025**
 - The camera-ready deadline is set for **May 30, 2025** (anywhere on Earth)

We look forward to receiving your submissions and hope to see you at the workshop!

For more information on the workshop, please visit <https://www.tacps.org>.