IEEE International Conference on Engineering Reliable Autonomous Systems (ERAS 2025)

29-30 May 2025, Worcester, MA, USA

Technical Program

ERAS 2025 Program At A Glance

Local time	Thursday 29th May, 2025	Friday 30th May, 2025	
9:00-9:15	Opening Session	Keynote Talk 3	
9:15-9:30	Keynote Talk 1	Towards Verified Visual Autonomy:	
9:30-9:45	Reliable Robotics Research at the Robotics and AI Institute	Perception Contracts and Abstract Rendering	
9:45-10:00	Ben Axelrod (Boston Dynamics, MA, USA)	Sayan Mitra (University of Illinois Urbana-Champaign, IL, USA)	
10:00-10:15		Technical Session 4 on	
10:15-10:30	Technical Session 1 on	Evaluation of Reliable Autonomous Systems	
10:30-10:45	Design of Reliable Autonomous Systems		
10:45-11:00			
11:00-11:15			
11:15-11:30	Coffee Break	Coffee Break	
11:30-11:45	Technical Session 2 on	Technical Session 5 on	
11:45-12:00	Reliable Autonomous Vehicles	Reliable Human-Robot Teaming	
12:00-12:15			
12:15-12:30	Lunch	Lunch	
12:30-12:45			
12:45-13:00			
13:00-13:15			
13:15-13:30			
13:30-13:45	Keynote Talk 2	Poster Session 1	Workshop - SAFE
13:45-14:00	Contributions to Assurance from Basic and Applied Research	(Online)	Main Organizer:
14:00-14:15	Craig Lennon (US Army)		Amy Fang
14:15-14:30			(MIT, MA, USA)
14:30-14:45	Technical Session 3 on	Poster Session 2	
14:45-15:00	Reliable Vision Autonomous Systems	(On-site)	
15:00-15:15			
15:15-15:30			
15:30-15:45	Coffee Break	Coffee Break	
15:45-16:00			
16:00-16:15	Tutorial - HEART		
16:15-16:30	Main Organizer:		
16:30-16:45	Jordan Fischer	Farewell Gathering	
16:45-17:00	(IBM, USA)	Closing Session	
17:00-17:15	Welcome Gathering		
17:15-17:30			
17:30-17:45			
17:45-18:00			
18:00-18:15	Banquet		
18:15-18:30			
18:30-18:45			
18:45-19:00			
19:00-19:15			
19:15-19:30			
19:30-19:45			
19:45-20:00			
20:00-20:15			
20:15-20:30			
20:30-20:45			
20:45-21:00			

All times are provided in the local time (EDT, UTC-4) of the venue (Worcester, MA, USA).

9:00-9:15 **Opening Session** [ROOM] [ZOOM LINK]

9:15-10:15 **Plenary Talk 1** (Session Chair:) [ROOM] [ZOOM LINK]

Title: Reliable Robotics Research at the Robotics and AI Institute

Speaker: Ben Axelrod (Boston Dynamics, MA, USA)

10:15-11:15 **Technical Session 1: Session on Design of Reliable Autonomous Systems** [Oral Presentations] (Session Chair:) [ROOM] [ZOOM LINK]

10:15-10:30 Paper #16: Skill-Based Architectures in Autonomous Systems: An Empirical Study

Pierre Malafosse, Alexandre Albore, Jérémie Guiochet, Charles Lesire

10:30-10:45 Paper #31: Reliable Robot Missions in Dynamic Environments Using Agent-based Controllers

Raynaldio Limarga, Kwai Wa Tse, Louise A. Dennis, Clare Dixon, Fatma Faruq, Michael Fisher

10:45-11:00 Paper #44: From Developer Needs to Domain-Specific Languages: Specifying Sceneries for Simulation-Based Validation of Mobile Robots

Argentina Ortega, Samuel Parra, Sven Schneider, Nico Hochgeschwender

11:00-11:15 Paper #02: Automatic Tuning of Autonomous System Design Parameters for Performance Robustness

Paul Stankiewicz, Jordan Appler

11:15-11:30 **Coffee Break**

11:30-12:15 **Technical Session 2: Session on Reliable Autonomous Vehicles** [Oral Presentations] (Session Chair:) [ROOM] [ZOOM LINK]

11:30-11:45 Paper #46: Advancing Autonomous Vehicle Safety: A Combined Fault Tree Analysis and Bayesian Network Approach

Lansu Dai, Burak Kantarci

11:45-12:00 Paper #43: Autonomous Robotic Swarms: A Corroborative Approach for Verification and Validation

Dhaminda B. Abeywickrama, Suet Lee, Chris Bennett, Razanne Abu-Aisheh, Tom Didiot-Cook, Simon Jones, Sabine Hauert, Kerstin Eder

12:00-12:15 Paper #20: Towards a Resilient Framework for Multirotor UAVs: Autonomous Adaptation to Failures and Disturbances

Luis Hector Manjarrez Muñoz, Eduardo Steed Espinoza Quesada, Luis Rodolfo Garcia Carrillo

12:15-13:30 **Lunch**

13:30-14:30 **Plenary Talk 2** (Session Chair:) [ROOM] [ZOOM LINK]

Title: Contributions to Assurance from Basic and Applied Research

Speaker: Craig Lennon (US Army)

14:30-15:30 **Technical Session 3: Session on Reliable Vision Autonomous Systems** [Oral Presentations] (Session Chair: Joanna Olszewska, University of the West of Scotland, UK) [ROOM] [ZOOM LINK]

14:30-14:45 Paper #08: Arguing Reliability of Machine Learning-based Components

Boyue Caroline Hu, Alessio Di Sandro, Lina Marsso, Krzysztof Czarnecki, Marsha Chechik

14:45-15:00 Paper #26: Monitoring Safety Properties for Autonomous Driving Systems with Vision-Language Models

Felipe Toledo, Sebastian Elbaum, Divya Gopinath, Ramneet Kaur, Ravi Mangal, Corina S. Păsăreanu, Anirban Roy, Susmit Jha

15:00-15:15 Paper #11: NeRF-To-Real Tester: Neural Radiance Fields as Test Image Generators for Vision of Autonomous Systems

Laura Weihl, Bilal Wehbe, Andrzej Wąsowski

15:15-15:30 Paper #39: Why Good Detectors Can Make Bad Trackers: mAP Worse than Random Chance at Model Selection

Trenton Tabor, Tomasz Swierzewski, Casidhe Hutchison, Oren Wright, Eric Heim, Christopher S. Timperley

15:30-16:00 **Coffee Break**

16:00-17:00 **Tutorial** [ROOM] [ZOOM LINK]

Title: HEART - Hardened Extension of the Adversarial Robustness Toolbox (HEART): Evaluating and Hardening AI Models against Novel Attack Vectors

Speaker: Jordan Fischer (IBM, USA)

17:00-18:00 **Welcome Gathering** [ROOM] [ZOOM LINK]

18:00-21:00 **Banquet** [ROOM]

9:00-10:00 **Plenary Talk 3** (Session Chair:) [ROOM] [ZOOM LINK]

Title: Reliable Robotics Research at the Robotics and AI Institute

Speaker: Ben Axelrod (Boston Dynamics, MA, USA)

10:00-11:15 **Technical Session 4: Session on Evaluation of Reliable Autonomous Systems** [Oral Presentations] (Session Chair:) [ROOM] [ZOOM LINK]

10:00-10:15 Paper #09: Diffusion-Based Failure Sampling for Evaluating Safety-Critical Autonomous Systems

Harrison Delecki, Marc R. Schlichting, Mansur Arief, Anthony Corso, Marcell Vazquez-Chanlatte, Mykel J. Kochenderfer

10:15-10:30 Paper #54: Automation Testing Framework for Reliable Autonomous Agentic AI

Grant Martin, Joanna Olszewska

10:30-10:45 Paper #38: Democracy Saves Robot: Crowd Voting Dramatically Outperforms Individual Judgments at Validating System Specifications

Ho Chit Siu, Isabelle Hurley, Rohan Paleja, Ashley Suh, Jaime D. Peña

10:45-11:00 Paper #33: Towards Systematic Maintenance of Assurance for Evolving Self-Adaptive Systems

Logan Murphy, Marc Carwehl, Juliane Päßler, Marsha Chechik

11:00-11:15 Paper #42: Conduct Governance Assurance - An Architecture Implementation for High-Risk Autonomous Systems

Andrew Schellenberg, Emily Newman, Charles Loughlin, Tyler Brooks

11:15-11:30 **Coffee Break**

11:30-12:15 **Technical Session 5: Session on Reliable Human-Robot Teaming** [Oral Presentations] (Session Chair:) [ROOM] [ZOOM LINK]

11:30-11:45 Paper #06: Robot Competency Self-Assessments for Assured Mission Management in Uncertain Environments

Nicholas Conlon, Nisar R. Ahmed, Daniel Szafir

11:45-12:00 Paper #45: Maximizing Reputation for Serving Time-Constrained Tasks with Distributed Heterogeneous Teams

Mela Coffey, Arnav Chaudhry, Alyssa Pierson

12:00-12:15 Paper #19: Explainability Pattern Specifications for Human-Robot Teamwork

Hazel M. Taylor, Anastasia Mavridou, Marie Farrell, Louise A. Dennis

12:15-13:30 **Lunch**

13:30-14:30 **Technical Session 6a: Session on Challenges in Engineering Reliable Autonomous Systems (I)** [Online Poster Presentations] (Session Chair:) [ZOOM LINK]

13:30-13:40 Paper #30: Defining and Designing Reliable AI-Enabled and Autonomous Systems
Benjamin D. Werner, Benjamin J. Schumeg, Shawn P. Brady, Nathan W. Herbert, James J. Foerster

13:40-13:50 Paper #29: C2HI: Towards a Command and Control Hierarchical Interface for Human-Robot Teams in Dynamic Social Environments
John A. Duncan, Farshid Alambeigi, Mitchell W. Pryor

13:50-14:00 Paper #48: Human Systems Integration for Human Machine Integrated Formations
Elizabeth Mezzacappa, Dominic T. Cheng, Alexis M. Cady, Florence Chua

14:00-14:10 Paper #10: Digital Twin Synchronization: Bridging the Sim-RL Agent to a Real-Time Robotic Additive Manufacturing Control
Matsive Ali, Sandesh Giri, Sen Liu, Qin Yang

14:10-14:20 Paper #32: RailGoerl24: Görlitz Rail Test Center CV Dataset 2024
Rustam Tagiew, Ilkay Wunderlich, Mark Sastuba, Kilian Göller, Steffen Seitz

14:30-16:30 **Technical Session 6b: Session on Challenges in Engineering Reliable Autonomous Systems (II)** [On-site Poster Presentations] (Session Chair:) [ROOM]

14:30-16:30 Paper #40: Look What You Made Me Do: Formal Methods and the Verification-Validation Gap in System Assurance
Ho Chit Siu, Kevin J. Leahy, Jaime D. Peña, Zachary Serlin

14:30-16:30 Paper #23: Consistency Measurement as a Means to Enhance Reliability in Autonomous Systems
Pragati Satpute

14:30-16:30 Paper #17: Neuroimaging and Physiological Data-driven Autonomous Vehicle Driving Simulation System in Extended Reality
Curt Lynch, Kyle Byassee, Isaac Copeland, Seth Hatchett, Saman Sargolzaei

14:30-16:30 Paper #53: A Framework for Filtering Neural Network Predictions for Robust State Estimation
Rohan Walia, Kevin Leahy

14:30-16:30 Paper #34: Artificial Intelligence on the Edge for Enabling Reliable Affordable Mass
Kin Gwn Lore, James P. Wilson, Subramanya Nageshrao, Gerald Wang, Timothy E. Wang, Mark Moulin, Amit Bhatia, Francesca Stramandinoli

15:30-16:00 **Coffee Break**

13:30-16:30 Workshop – SAFE [ROOM] [ZOOM LINK]

SAFE-Robotics: Safe, Assured, Formal methods-Enabled Robotics

Main Organizer: Amy Fang, MA,USA

URL: https://sites.mit.edu/saferobotics/

16:30-16:45 **Farewell Gathering** [ROOM] [ZOOM LINK]

16:45-17:00 **Closing Session** [ROOM] [ZOOM LINK]