Meriel von Stein

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PROFESSIONAL SUMMARY

Applied AI/ML and robotics researcher with expertise in building reliable, real-world autonomous systems. Experienced in adversarial testing, perception-action integration, and safety-critical learned components. Strong programming background with a track record of impactful research, interdisciplinary collaboration, and scalable system design.

EDUCATION

PhD of Computer Science (Software Engineering & Robotics) Charlottesville, VA | July 2025
University of Virginia, advised by Sebastian Elbaum

Masters of Computer Science (Software Engineering & Robotics) Charlottesville, VA | Aug. 2022
University of Virginia

BA Honors of Art History (Islamic Art & Architecture) Oberlin, OH | May 2016
Oberlin College

PUBLICATIONS (5/13)

NaturalADV: An Exploratory Framework to Balance Adversarial Strength and Stealth in Autonomous Driving Environments
Meriel von Stein
AAAI 2025 DATASAFE Workshop on Datasets and Evaluators of AI Safety.
OpenReview for AAAI 2025 DATASAFE Workshop

Automated Generation of Transformations to Mitigate Sensor Changes in ADS
Meriel von Stein, Hongning Wang, Sebastian Elbaum
IEEE Robotics and Automation Letters Journal (RA-L) March 2024.
DOI: 10.1109/LRA.2024.3405810

DeepManeuver: Adversarial Test Generation for Trajectory Manipulation of Autonomous Vehicles
Meriel von Stein, David Shriver, Sebastian Elbaum
IEEE Transactions on Software Engineering Journal (TSE) 2023.
DOI: 10.1109/TSE.2023.3301443

Finding Property Violations through Network Falsification: Challenges, Adaptations and Lessons Learned from OpenPilot
Meriel von Stein, Sebastian Elbaum
IEEE/ACM International Conference on Automated Software Engineering (ASE) 2022.
DOI: 10.1145/3551349.3559500

Automated Environment Reduction for Debugging Robotic Systems
Meriel von Stein, Sebastian Elbaum
IEEE International Conference on Robotics and Automation (ICRA) 2021.
DOI: 10.1109/ICRA48506.2021.9561997.

HONORS AND LEADERSHIP

University of Virginia Computer Science Department Award for Outstanding Service (2024-2025 Academic year).Granted by faculty to one graduate student for excellence in service ($1,000).
University of Virginia Copenhaver Graduate Fellowship (2024-2025 Academic year). Fellowship awarded by panel of UVA School of Engineering and Applied Science faculty for research excellence ($12,000).
University of Virginia Graduate Teaching Award (May 2023). Recipient of university-wide award for student teaching. First CS student to receive this award since 2008 ($500).
CSGSG Mentoring Chair (2022-2023) enrich mentoring program, advocate for student well-being in faculty meetings, organize orientation and prospective visits, and host department events.
CRA-W Grad Cohort Workshop selected speaker (2023) on mentoring work and upcoming research.
Recipient of Oberlin College Grant & John F. Oberlin Scholarship (2012-2016). $35,000/year.

WORK EXPERIENCE

THE MITRE CORPORATION | Senior Autonomous Systems Engineer September 2026 - present

- Researcher for testing and evaluation of AI-enabled robotic and edge systems.
- Build prototypes and surrogate systems.

RAND CORPORATION | Information Scientist July 2025 - September 2026

- Researcher for military and national security projects for future-facing warfighting concepts.
- Designer and developer of testing, analysis and new functionality for simulation engines to model speculative battlefield systems interactions.
- Designer and developer of tooling specializing in autonomous robotic capabilities and AI/ML for defense.

UNIVERSITY OF VIRGINIA | PhD Candidate Aug. 2018 - July 2025

- Research assistant (qualified in March 2020). Project lead for *research at the intersection of software engineering, robotics, and AI/ML for perception*, with a focus on developing techniques to assess and ensure the robustness of AI/ML-enabled safety-critical systems.
- Teaching assistant/Supporting instructor: *Robotics for Software Engineers* (MS/BSc), Fall 2020 - Fall 2022. *Software Analysis* (MS/PhD), Fall 2019. *Introduction to Embedded Computer Systems* (BSc), Spring 2019.

NASA GODDARD SPACE FLIGHT CENTER | Software Engineer Aug. 2017 – Aug. 2018

- Develop, update & maintain GMSEC satellite ground system API and component code.
- Reconcile federal infosec requirements with implementation from a top-down/bottom-up approach.
- Support code reviews & evaluate software systems from a security assurance perspective.
- Interview stakeholders on current & projected implementation of NIST and internal security standards.

NASA KENNEDY SPACE CENTER | Software Engineer Intern Dec. 2016 – Aug. 2017

- Build & test proof-of-concept Beowulf cluster for granular mechanics and robotics simulations.
- Develop and test software for SwampWorks research robotics projects and cyberphysical system prototypes.
- Design and develop automated unit and system testing software suite for launch control systems.

UNIV. OF NEBRASKA - LINCOLN | Cybersecurity Research Fellow Jun. – Aug. 2016

- Ran and extended static analysis tools for malicious Android apps using C++ to handle Java 8 Reflection calls.
- Wrote colluding Android apps in Eclipse and Android Studio for sample runs of static analysis tool.

PROJECTS AND ARTIFACTS

Defects4DeepNav: A full stack pipeline for collecting data, training a computer vision model, and deploying it on multiple ROSbot platforms for navigation.

PreFixer: An unsupervised low-cost methods for learning transformations between vision datasets to overcome sensor hardware versioning and preserve downstream DNN prediction.

OpenPilot Falsification: Extend state-of-the-art falsification tool DNNF to apply to complex deep neural networks used in the commercial safety-critical driver assistance system OpenPilot.

DeepManeuver: Developed a new adversarial patch generation technique to leverage the kinematics of the vehicle and state of the test environment.

DDEnv: End-to-end tool for delta-debugging robotic environments with a semi-known failure distribution.

Robotics for Software Engineers: A course for undergraduates that pairs robotics concepts and software engineering techniques, prioritizes experiential learning, and lowers barriers to entry.

SKILLS

Programming/Scripting Languages: Python, C/C++, Java, Bash, Visual Basic
Robotics/ML Frameworks: ROS, ROS2, PyTorch, ONNX, TensorFlow, Keras, scipy, scikit-learn, OpenCV
Simulation Development: Gazebo, BeamNG, Carla, Udacity, FlightGoggles, Unity, Blender, AFSIM, particle simulation
Other: Git/GitHub, MatLab, R, AutoCAD, VirtualBox, Docker, LaTeX, Gimp, JavaScript, TypeScript, HTML/CSS