Noah T. Curran

PhD Candidate · Computer Science & Engineering

University of Michigan, 2260 Hayward Street, Ann Arbor, MI 48109

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Education

University of Michigan — *Ann Arbor, Michigan*

PhD Computer Science & Engineering — *Aug. 2020 - present*

- Advisor: Kang G. Shin

University of Michigan — *Ann Arbor, Michigan*

MS Computer Science & Engineering — *Aug. 2020 - Dec. 2021*

- Advisor: Kang G. Shin

Purdue University — *West Lafayette, Indiana*

BS Computer Science (Hons.) · BS Mathematics — *Aug. 2017 - May 2020*

- Advisors: Yung-Hsiang Lu (Purdue), George Thiruvathukal (Loyola Chicago), and Felix Lin (Purdue, now at UVA)
- Most Outstanding Senior in Computer Science

Professional Experience

University of Michigan, Dept. of Computer Science and Engineering — *Ann Arbor, MI*

Graduate Student Research Assistant — *Aug. 2020 - present*

- Investigated the security and reliability of semi-autonomous vehicles (SAVs); focusing on answering the question of who to trust when autonomous and manual control of SAVs are in conflict.
- Conducted research to utilize smartphone sensors to validate the correctness of vehicle sensors even when the smartphone sensing data is noisy from physical use. Accepted for presentation at CNS '23.
- Discovered inconsistencies in the Boeing 737-MAX MCAS that may allow dangerous control and devised an alternative, safer method for commanding the pitch control of an aircraft. Accepted for presentation at EMSOFT '24.

Toyota Research Institute of North American, Future Research Division — *Ann Arbor, MI*

Cyber-Physical Systems Research Intern — *May 2023 - Aug. 2023*

- Devised a solution for optimizing the locations of sensors on an autonomous vehicle to maximize chosen metrics, such as safety or cost.
- Further details withheld due to an ongoing patenting process.

Lear Corporation, Cybersecurity Division — *Ann Arbor, MI*

Cybersecurity Research Intern — *May 2022 - Jan. 2023*

- Developed an anti-dooring function for vehicles that passively uses pedestrian BLE devices.
- Published and presented research at VehicleSec '23, winning Best Short/WIP Paper Runner-Up.

Purdue University, Dept. of Electrical and Computer Engineering — *West Lafayette, IN*

Undergraduate Research Assistant — *Aug. 2018 - May 2020*

- Led research efforts for determining the effectiveness of code review for research software and developed and presented three workshops on utilizing code review in research.
- Insights provided by my leadership built the foundations for a collaboration with Google ($100,000) and three successful NSF proposals amounting in a total of $1,157,496.
- Developed a partial JPEG decoding tool to enable research on secure tensor processing within devices with small memory.

Lawrence Livermore National Laboratory, NARAC — *Livermore, CA*

Software Engineering Intern — *May 2018 - Aug. 2018*

- Developed a front-end platform for atmospheric scientists at NARAC to perform dispersion model calculations for particles (e.g., smoke, radioactive, aerosol) released into the atmosphere.
- Used Angular and Node.js to modernize existing Java-based applications.

Publications

Equal contribution denoted with *

Noah T. Curran, Thomas W. Kennings, and Kang G. Shin. 2024. *Analysis and Prevention of MCAS-Induced Crashes*. ACM SIGBED International Conference on Embedded Software (EMSOFT '24).
(Acceptance rate: 28/129 = 21.7%) · [Best Paper Finalist] · [PDF] · [Code]

Noah T. Curran, Minkyoung Cho, Ryan Feng, Liangkai Liu, Brian Jay Tang, Pedram MohajerAnsari, Alkim Domeke, Mert D. Pesé, and Kang G. Shin. 2024. *Achieving the Safety and Security of the End-to-End AV Pipeline*. 1st Cyber Security in Cars Workshop (CSCS '24).
[Co-Located with CCS '24] · [PDF]

Noah T. Curran*, Arun Ganesan*, Mert D. Pesé, Kang G. Shin. 2023. *Using Phone Sensors to Augment Vehicle Reliability*. IEEE Conference on Communications and Network Security (CNS '23).
(Acceptance rate: 32/112 = 28.6%) · [PDF]

Noah T. Curran, William Hass, Kang G. Shin, Lars Wolleschensky, Rekha Singoria, Isaac Snellgrove, Ran Tao. 2023. *WIP: Augmenting Vehicle Safety With Passive BLE*. ISOC Symposium on Vehicle Security and Privacy (VehicleSec '23).
(Acceptance rate: 6/16 = 37.5%) · [Best WIP Paper Runner-Up] · [PDF]

Isha Ghodgaonkar, Abhinav Goel, Fischer Bordwell, Caleb Tung, Sara Aghajanzadeh, **Noah T. Curran**, Ryan Chen, Kaiwen Yu, Sneha Mahapatra, Vishnu Banna, Gore Kao, Kate Lee, Xiao Hu, Nick Eliopolous, Akhil Chinnakotla, Damini Rijhwani, Ashley Kim, Aditya Chakraborty, Mark Daniel Ward, Yung-Hsiang Lu, George K. Thiruvathukal. 2020. *Observing Responses to the COVID-19 Pandemic using Worldwide Network Cameras*. arXiv preprint arXiv:2005.09091.
[PDF]

Awards, Fellowships, & Grants

2024	**Student Travel Grant**, ESWEEK 2024	*$ 1,500*
	Student Travel Grant, Rackham, University of Michigan	*$ 900*
	Best Paper Finalist, EMSOFT 2024	
2023	**Student Travel Grant**, CNS 2023	*$ 1,200*
	Best WIP Paper Runner-Up, VehicleSec 2023	
	Student Travel Grant, VehicleSec 2023	*$ 650*
	Student Travel Grant, Rackham, University of Michigan	*$ 900*
2022	**NSF Graduate Research Fellowship Program Honorable Mention**, NSF	
2020	**Most Outstanding Senior**, Dept. of Computer Science, Purdue University	*$ 500*
2019	**NSF SaTC PI Meeting Student Travel Grant**, NSF	*$ 1,500*
	NSF REU, Purdue University	*$ 5,000*
2017	**Presidential Scholarship**, Purdue University	*$ 5,000 / yr.*

Mentoring

2024	**Katelyn Abellera**, Undergrad, University of Michigan
2024	**Porvesh Balasubramanian**, Undergrad, University of Michigan
2023	**Yinghui He**, Undergrad, University of Michigan ⟶ Princeton PhD
2022-2023	**Thomas Kennings**, Undergrad, University of Michigan ⟶ NASA Glenn Research Center
2022	**Liuqing Yang**, Undergrad, University of Michigan ⟶ Splunk SWE