Sepehr Samavi

Ph.D. Candidate, University of Toronto

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(Last updated July 4, 2025)

EDUCATION

Ph.D., University of Toronto *since 01/2021*
Institute for Aerospace Studies *Toronto, Canada*
Advisors: Angela P. Schoellig (site), Florian Shkurti (site)
Committee: Timothy D. Barfoot, Jonathan S. Kelly

M.A.Sc., University of Toronto *11/2021*
Institute for Aerospace Studies, Emphasis in Robotics *Toronto, Canada*
Title: Accounting for Unpredictability in Autonomous Driving Behaviour [pdf]
Advisor: Angela P. Schoellig

B.A.Sc. in Engineering Science (with Honours), University of Toronto *06/2018*
Division of Engineering Science, Robotics Engineering Option *Toronto, Canada*
Thesis Title: Lane Detection for an Autonomous Vehicle [pdf]
Thesis Advisor: Angela P. Schoellig

AFFILIATIONS

Visiting Researcher, Technical University of Munich *since 11/2024*
At the Learning Systems and Robotics Lab. [site]

Graduate Student Researcher, Vector Institute for Artificial Intelligence *since 01/2020*
An independent, not-for-profit corporation that is part of the Pan-Canadian AI Strategy dedicated to advancing the growth of Artificial Intelligence in Canada. Researchers have access to computing, office space, and a research grant among other resources. Member of Space Planning Committee (Summer 2023). [site]

Graduate Student Researcher, University of Toronto Robotics Institue *since 06/2019*
An interdepartmental research and teaching institute for fostering collaboration among researchers in robotics and related areas. [site]

Deputy Lead, aUToronto, U of T's self-driving car team *09/2018 - 09/2019*
Competing in the General Motors/SAE AutoDrive Challenge, a three-year competition to develop a self-driving car (2017-2020). The team consisted of around 80 undergraduate students and a few graduate students advised by faculty. As a graduate student I helped the team-lead with preparing for the second year of the competition. Previously as an undergraduate, I was an autonomy software developer for the first year of the competition (09/2017 - 06/2018). [site]

AWARDS AND HONOURS

Ontario Graduate Scholarshop, $15K *09/2024 - 09/2025*
Government of Ontario, *Scholarship for one year of Ph.D. research.*

Alexander Graham Bell Canada Graduate Scholarship, $105K *01/2021 - 12/2023*
Natural Sciences and Engineering Research Council, Government of Canada
Scholarship for three years of Ph.D. research.

Ontario Graduate Scholarship, $10K *09/2019 - 04/2020*
Government of Ontario, *Scholarship for M.A.Sc. research.*

Vector Scholarship in Artificial Intelligence, $17.5K *09/2018 - 09/2019*
Vector Institute, *Scholarship for M.A.Sc. research.*

Exceptional Opportunities Award, $3K *06/2014 - 08/2014*
University of Toronto, *Funding for undergraduate research at Harvard Medical School.*

President's Entrance Scholarship, $2K *09/2013*
University of Toronto, *Entrance scholarship for undergraduate studies.*

Best Poster Presentation *06/2019*
International Conference on Robots and Vision (CRV)
as the presenting author for publication [C2].

First Place in 2019 SAE AutoDrive Challenge *06/2019*
GM and SAE International, Second year of three-year competition
as a deputy lead of the University of Toronto team, aUToronto.

First Place in 2018 SAE AutoDrive Challenge *06/2018*
GM and SAE International, First year of three-year competition
as a member of the University of Toronto team, aUToronto.

PUBLICATIONS

An up-to-date list of my publications is available on my Google Scholar profile.

Journal Impact Factors (JIF) scores were obtained from Web of Science Journal Info 06/2025.

In press - Journal Publications

[J1] **Sepehr Samavi**, Anthony Lem, Fumiaki Sato, Sirui Chen, Qiao Gu, Keijiro Yano, Angela P. Schoellig, and Florian Shkurti. SICNav-Diffusion: Safe and Interactive Crowd Navigation with Diffusion Trajectory Predictions. *IEEE Robotics and Automation Letters (RA-L), in press*, 2025. [JIF 5.3] [site][code][arXiv]

Peer Reviewed - Journal Publications

[J2] **Sepehr Samavi**, James R. Han, Florian Shkurti, and Angela P. Schoellig. SICNav: Safe and Interactive Crowd Navigation using Model Predictive Control and Bilevel Optimization. *IEEE Transactions on Robotics (T-RO)*, 41:801–818, 2024. [JIF 10.5] [site][code][arXiv]

[J3] Keenan Burnett, Jingxing Qian, Xintong Du, Linqiao Liu, David J. Yoon, Tianchang Shen, Susan Sun, **Sepehr Samavi**, Michael J. Sorocky, Mollie Bianchi, Kaicheng Zhang, Arkady Arkhangorodsky, Quinlan Sykora, Shichen Lu, Yizhou Huang, Angela P. Schoellig, and Timothy D. Barfoot. Zeus: A system description of the two-time winner of the collegiate SAE AutoDrive competition. *Journal of Field Robotics*, 1(28), 2020. [url][pdf]

Peer Reviewed - Conference Proceedings

[C1] **Sepehr Samavi**, Florian Shkurti, and Angela P. Schoellig. Does unpredictability influence driving behavior? In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1720–1727, 2023. [url][pdf]

[C2] Keenan Burnett, **Sepehr Samavi**, Steven L Waslander, Timothy D Barfoot, and Angela P Schoellig. autotrack: A lightweight object detection and tracking system for the sae autodrive challenge. In *Conference on and Robots and Vision (CRV)*, pages 209–216, 2019. **Best Poster Presentation Award.** [url][pdf]

[C3] Keenan Burnett, Andreas Schimpe, **Sepehr Samavi**, Mona Gridseth, Chengzhi Winston Liu, Qiyang Li, Zachary Kroeze, and Angela P. Schoellig. Building a Winning Self-Driving Car in Six Months. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 9583–9589, May 2019. [url][pdf]

EMPLOYMENT HISTORY

Technical University of Munich, Munich, Germany *since 11/2024*
Chair of Safety, Performance and Reliability for Learning Systems,
Visiting Research Fellow (Wissenschaftlicher Mitarbeiter)

University of Toronto, Toronto, Canada *since 01/2021*
Division of Engineering Science
Teaching Assistant, *Artificial Intelligence ROB311*

Magna International, Greater Toronto Area, Canada *05/2016 - 07/2017*
Magna Electronics Vision Centre
Algorithms Research Intern, *Perception for Magna Automated Parking Project*

Harvard Medical School, Boston, USA *06/2014 - 08/2014*
Tearney Lab, Wellman Center for Photomedicine
Undergraduate Research Intern, *Prototyping for gastrointestinal tethered capsule retraction device*

ADVISING AND MENTORSHIP

Masters Thesis Supervision
Niklas Schlüter (site), Technical Unviersity of Munich (with Lukas Brunke and Martin Schuck) *2024-2025*

Undergraduate Thesis Supervision
James R. Han (site), Engineering Science, University of Toronto *2022-2023*

Undergraduate Summer Student Supervision
Xinyuan (Sam) Qiao (site), Engineering Science, University of Toronto *Summer 2021*
Ruichen (Spencer) Li (site), Elec. and Comp. Engineering, University of Toronto *Summer 2023*
Garvish Bhutani (site), Engineering Science, University of Toronto *Summer 2024*

INVITED TALKS

University of Toronto Robotics Institute 2021 Autonomous Vehicles Workshop *06/2021*
Student talk "Accounting for Unpredictability in Autonomous Driving Behaviour" [video]

PROFESSIONAL ACTIVITIES AND SERVICE

Workshop Organization
Co-organizer of *Workshop on Semantics for Robotics: From Environment Understanding and Reasoning to Safe Interaction*, Robotics: Science and Systems (RSS) [event page] *2024*

Committee Service
Student Experience Committee, Univ. of Toronto Inst. for Aerospace Studies *2023-2024*
Space Planning Committee, Vector Institute for Artificial Intelligence *2023*

Reviewing
IEEE International Conference on Robotics and Automation (ICRA) *since 2020*
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) *since 2020*
IEEE Robotics and Automation Letters (RA-L) *since 2022*
Conference on Robot Learning (CoRL) *since 2023*

MEDIA

ZDF moma future: Robot learns how to walk like a human (in German). Original title: *moma future: Roboter lernt Menschenlauf.* The German public broadcaster, ZDF, produced a news story about our crowd navigating robot aired on their morning news program Morgenmagazin. 05/2025. [ZDF video] [English subtitles]

AI: Hype vs. Reality. S1E1 AI That Drives: Self-Driving Cars. A popular science podcast and video by Dell Technologies about emerging AI technologies. 09/2019. [audio] [video] [website]

University of Toronto Engineering News. A news article announcing recipients of the Vector Institute Graduate Scholarship in AI. 12/2018. [url]

OUTREACH AND VOLUNTEERING

Civic Engagement *12/2021*
I helped draft a letter that was submitted to the Toronto City Council on behalf of the University of Toronto Robotics Institute to advocate for policies that enable the responsible development of service robots in the city. [press release][pdf]

STEM outreach & live demonstrations *09/2018 - present*
I often volunteer to show live demonstrations of our robots to visitors, who have included government officials, representatives from industry, journalists, professors and their research groups, elementary and high-school students (e.g. 40 students aged 10-12 years and 30 high school students in 11/2019), as well as undergraduate and graduate students.

SKILLS AND LANGUAGES

Programming and Scripting: Python, C/C++, Java, MATLAB, bash

Scientific Computing: Un*x (macOS, Linux), ROS, Windows, Slurm

Languages: English (native), Persian (native), French (fluent)