



Joey Wilson

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🔗 <https://github.com/tigeriv>

Education

2025. PhD Robotics

University of Michigan
Ann Arbor – USA
GPA 4.0

2024. Graduate Certificate Comput. Neuroscience

University of Michigan
Ann Arbor – USA

2021. MS Robotics

University of Michigan
Ann Arbor – USA

2019. BS Computer Eng.

Cal Poly SLO
San Luis Obispo – USA

Scientific interests

- Deep Learning
- Uncertainty Quantification
- Autonomous Vehicles
- Perception

Select Articles

J. Wilson et al. 'Convolutional Bayesian Kernel Inference for 3D Semantic Mapping', in *IEEE International Conference on Robotics and Automation (ICRA)*, May 2023.

J. Wilson et al., 'MotionSC: Data Set and Network for Real-Time Semantic Mapping in Dynamic Environments', in *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 3, pp. 8439-8446, July 2022.

A. Unnikrishnan, J. Wilson et al., 'Dynamic Semantic Occupancy Mapping using 3D Scene Flow and Closed Form Bayesian inference', in *IEEE Access*, vol. 10, pp. 97954-97970, 2022.

Experience

May 2021 – Present PhD Candidate

University of Michigan
Researching perception for autonomous vehicles.
Advisors: Dr. Kira Barton and Dr. Maani Ghaffari.

Jan. 2021 – May 2021. Machine Learning Researcher

University of Michigan UQ-SciML Lab
Researched Bayesian experimental design for robotics.
Advisor: Dr. Xun Huan.

Jan. 2019 – Aug. 2020. Autonomous Vehicle Researcher

Ford and Cal Poly Corporation
Researched self-driving car tracking defense strategies.
Advisor: Dr. Bruce DeBruhl

Jun. 2017 – Sep. 2018. Engineering Intern

Northrop Grumman
Wrote software, performed data analysis, and analyzed circuitry for ICBM ground systems.

Select Presentations

J. Wilson et al. 'Convolutional Bayesian Kernel Inference for 3D Semantic Mapping', in *IEEE International Conference on Robotics and Automation (ICRA)*, London, England, May 2023.

1 Honors

- ICRA 2023 RAS Travel Grant, *IEEE Robotics and Automation Society*, 2023.
- Second Place in Best Poster Competition, *Automotive Research Center Annual Review*, 2023.
- Strategic Partnership Scholarship, *Munich University of Applied Sciences*, 2018.
- Freshman Award, *Cal Poly Elevator Pitch Competition*, 2015.
- Member, *IEEE Eta Kappa Nu*.

2 Articles

2.1 Journals

- J. Wilson, J. Song, Y. Fu, A. Zhang, A. Capodiecici, P. Jayakumar, K. Barton, and M. Ghaffari, 'MotionSC: Data Set and Network for Real-Time Semantic Mapping in Dynamic Environments', in *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 3, pp. 8439-8446, July 2022.
- A. Unnikrishnan, J. Wilson, L. Gan, A. Capodiecici, P. Jayakumar, K. Barton, and M. Ghaffari, 'Dynamic Semantic Occupancy Mapping using 3D Scene Flow and Closed Form Bayesian inference', in *IEEE Access*, vol. 10, pp. 97954-97970, 2022.
- J. Wilson, Y. Fu, J. Friesen, A. Capodiecici, P. Jayakumar, K. Barton, and M. Ghaffari, 'ConvBKI: Real-Time Probabilistic Semantic Mapping Network with Quantifiable Uncertainty', *in review*, pp. 1-18.
- Parker Ewen, Gitesh Gunjal, J. Wilson, Jinsun Liu, Challen Enniful Adu, Ram Vasudevan 'Not All Actions Are Created Equal: Bayesian Optimal Experimental Design for Safe and Optimal Nonlinear System Identification', *in review*, pp. 1-8.

2.2 Conferences

- J. Wilson, Y. Fu, A. Zhang, J. Song, A. Capodiecici, P. Jayakumar, K. Barton, and M. Ghaffari, 'Convolutional Bayesian Kernel Inference for 3D Semantic Mapping', in *IEEE International Conference on Robotics and Automation (ICRA)*, May 2023.
- F. Khosmood, E. Kusters, L. Soares, S. Verkruyse, Z. Vowell, and J. Wilson, 'Morgan papers: Exploring the correspondence of California's first female architect', in *Digital Humanities*, 2020.

2.3 Workshops

- J. Wilson, J. Song, Y. Fu, A. Zhang, A. Capodiecici, P. Jayakumar, K. Barton, and M. Ghaffari, 'MotionSC: Data Set and Network for Real-Time Semantic Mapping in Dynamic Environments', in *ICRA Workshop on Robotic Perception and Mapping*, Philadelphia, USA, June 2022.
- J. Wilson, M. Zhu, K. Barton, and M. Ghaffari, 'Real-Time and Recurrent Latent Map Propagation for Dynamic Outdoor Environments', in *IROS Workshop on Robotic Perception and Mapping*, Detroit, USA, September 2023.

3 Presentations

- 'Real-Time and Recurrent Latent Map Propagation for Dynamic Outdoor Environments', in *IROS Workshop on Robotic Perception and Mapping*, Detroit, USA, September 2023.
- 'Convolutional Bayesian Kernel Inference for 3D Semantic Mapping', in *IEEE International Conference on Robotics and Automation (ICRA)*, London, England, May 2023.
- 'Reliable and Real-Time Semantic Mapping in Dynamic Off-Road Environments', *Automotive Research Center Annual Program Review*, Ann Arbor, USA, May 2023.
- 'MotionSC: Data Set and Network for Real-Time Semantic Mapping in Dynamic Environments', in *Proc. IEEE/RSJ Int. Conf. Intell. Robots and Syst. (IROS)*, Kyoto, Japan, October 2022.
- 'Semantic Mapping in Dynamic Off-Road Environments', *Automotive Research Center Annual Program Review*, Ann Arbor, USA, June 2022.
- 'MotionSC: Data Set and Network for Real-Time Semantic Mapping in Dynamic Environments', in *ICRA Workshop on Robotic Perception and Mapping*, Philadelphia, USA, June 2022.

4 Teaching

- Fall 2023: ROB 535 **Self-Driving Cars**. Co-created perception half of the course. Planned syllabus and structure, gave several lectures, designed all perception homeworks.