FANGYU WU, Ph.D.

(314) 401-5007 | fywu85@gmail.com | Ithaca, NY, USA | https://fangyuwu.com/

SUMMARY

I am broadly interested in research and development at the intersection of transportation, robotics, energy, and sustainability. I have published 16 papers, accumulating over 1,200 citations in leading control, robotics, and transportation journals and conferences, with 8 of these as the first author. At heart, I am a scientist and engineer with a deep passion for research in multi-agent systems, intelligent transportation, embodied intelligence, and mechatronics.

EDUCATION

University of California, Berkeley

Ph.D. in EECS, Concentration on *Control, Intelligent Systems, and Robotics* — July 2024
M.Eng. in EECS, Concentration on *Data Science* — May 2019

University of Illinois at Urbana-Champaign

M.S. in CEE, Concentration on *Sustainable and Resilient Infrastructure Systems* — May 2018
B.S. in CEE with Minor in CS, Concentration on *Sustainable and Resilient Infrastructure Systems* — December 2015

WORK EXPERIENCE

Cornell University, *Postdoctoral Associate* — July 2024–*present*

- Developing robust routing methods for electric vehicles. The routing problems are solved as distributionally robust integer programs with ambiguity sets defined by the Wasserstein metric.
- Researching end-to-end planning and control for multi-agent robotic systems, with an emphasis on logistics services. The end-to-end problem is formulated as a mixed-integer optimization and solved with ML-driven heuristics.
- Coordinating with researchers and stakeholders from MetroLink Tulsa, MIT, NREL, the U.S. Department of Energy, and industry partners on an autonomous vehicle initiative in Tulsa, OK.

NVIDIA, *Optimization Intern* — May 2023–August 2023

- Developed a novel model predictive control cost function via principles of sliding mode control and control barrier functions. The predictive cost function ensures safe deceleration and acceleration in events of cut-ins.
- Conducted rigorous model calibration for optimized car-following behaviors in both simulations and real world. The resulting software is integrated into the 2024 production lines of Mercedes-Benz.

Intel, *Machine Learning Intern* — January 2018–April 2018

- Accelerated clients' computer vision and deep reinforcement learning applications in TensorFlow and Caffe on Intel Xeon CPUs. Our acceleration software has enabled our client's model to defeat the world champion Junghwan Park.
- Presented weekly to the project manager and team members about machine learning theories and applications. The presentation slides were kept as an internal reference by the team for future employee training.

RESEARCH EXPERIENCE

Berkeley Artificial Intelligence Research, *Research Assistant* — May 2018–July 2024

- Developed model predictive control, reinforcement learning, and mixed-integer optimization methods for multi-agent path planning and autonomous vehicle cruise control.
- Reconfigured commercial vehicles made by Toyota, Cadillac, and Nissan as custom drive-by-wire automated vehicles for large-scale autonomous driving field experiments performed in CA, AZ, and TN between 2021 and 2023.
- The work led to 6 journal and 6 conference publications, 5 of which I am the first author.

Coordinated Science Laboratory, *Research Assistant* — January 2016–May 2018

- Built microscopic simulation models through combining ordinary differential equations and neural networks for more realistic traffic microsimulation.
- Developed object tracking algorithms that tracks vehicles within sub pixel-level accuracy and low-energy estimation methods through sensor fusion (cameras, infrared sensors, and ultrasonic sensors) with real-world deployment in IL.
- The work led to 3 journal and 2 conference publications, 3 of which I am the first author.

TEACHING EXPERIENCE

EECS 106A / 106B, UC Berkeley, *Teaching Assistant* August 2021–December 2021, January 2023- May 2023

- Developed and optimized the lab sections of the robotics courses at UC Berkeley. The lab sessions cover kinematics, motion planning, control theory, and state estimation, as well as methods of interfacing with robots via ROS.
- Held weekly lab sessions and prepared presentations and exams for over 200 graduate and undergraduate students. I was recognized as an Outstanding Graduate Student Instructor by the department in 2024.

ENGIN 296MA, UC Berkeley, *Research Mentor* August 2019–May 2020

- Built a mechatronics laboratory from its conception to host a team of five graduate students for their Master of Engineering program. The laboratory and research initiative are featured in a televised interview by ARTE.
- Led the team to design 3D-printed unicycle and bicycle robots and an indoor localization system for multi-agent robotic research. The results were presented in the 2019 Cyber Physical Systems Principal Investigators' Meeting.

SELECTED PUBLICATIONS

1. **F. Wu**, D. Wang, M. Hwang, C. Hao, J. Lu, J. Zhang, C. Chou, T. Darrell, and A. Bayen. "Decentralized Vehicle Coordination: The Berkeley DeepDrive Drone Dataset and Consensus-Based Models." Accepted at *International Conference on Robotics and Automation*. 2025.
2. **F. Wu**, J. Carpio, M. Bunting, M. Nice, D. Work, J. Sprinkle, J. Lee, S. Hornstein, and A. Bayen. "Modifying Adaptive Cruise Control Systems for String Stable Stop-and-Go Wave Control." in *IEEE Robotics and Automation Letters*. 2024.
3. N. Lichtle, E. Vinitsky, M. Nice, R. Bhadani, M. Bunting, **F. Wu**, B. Piccoli, B. Seibold, D. Work, J. Lee, J. Sprinkle, and A. Bayen. "From sim to real: A pipeline for training and deploying traffic smoothing cruise controllers." in *IEEE Transactions on Robotics*. 2024.
4. **F. Wu**, G. Wang, K. Wang, A. Keimer, I. Stoica, and A. Bayen. "Composing MPC with LQR and Neural Networks for Amortized Efficiency and Stable Control." in *IEEE Transactions on Automation Science and Engineering*. 2023.
5. **F. Wu**, and A. Bayen. "A MPC Approach to Car Following with Linearly Constrained Quadratic Programming." in *IEEE Control Systems Letters*. 2022.
6. E. Vinitsky, A. Kreidieh, C. Wu, L. Flem, N. Kheterpal, K. Jang, C. Wu, **F. Wu**, R. Liawand, E. Liang, and A. Bayen. "Benchmarks for Reinforcement Learning in Mixed-Autonomy Traffic." in *Conference on Robot Learning*. 2018.
7. **F. Wu**, and D. Work. "Connections between Classical Car Following Models and Artificial Neural Networks." in *IEEE International Conference on Intelligent Transportation Systems*. 2018.
8. R. Stern, Y. Chen, **F. Wu**, M. Churchill, and D. Work. "Quantifying Air Quality Benefits Resulting from Few Autonomous Vehicles Stabilizing Traffic." in *Transportation Research Part D: Transportation and the Environment*. 2018.
9. **F. Wu**, R. Stern, S. Cui, M. L. Delle Monache, R. Bhadanid, M. Bunting, M. Churchill, N. Hamilton, R. Haulcy, B. Piccoli, B. Seibold, J. Sprinkle, and D. Work. "Tracking Vehicle Trajectories and Fuel Rates in Oscillatory Traffic." in *Transportation Research Part C: Emerging Technologies*. 2017.
10. R. Stern, S. Cui, M. L. Delle Monache, R. Bhadani, M. Bunting, M. Churchill, N. Hamilton, R. Haulcy, H. Pohlmann, **F. Wu**, B. Piccoli, B. Seibold, J. Sprinkle, and D. Work. "Dissipation of Stop-And-Go Waves via Control of Autonomous Vehicles: Field Experiments." in *Transportation Research Part C: Emerging Technologies*. 2017.

SELECTED AWARDS

1. Milton Pikarsky Memorial Award for Best Doctoral Dissertation. CUTC. 2025.
2. Eli Jury Award for Outstanding Achievement in Systems and Control. UC Berkeley EECS. 2024.
3. Best Paper Award. Transportation Research Part C: Emerging Technologies. 2020.
4. Sevin Rosen Funds Award for Innovation. UC Berkeley EECS. 2019.
5. Dwight David Eisenhower Fellowship. US Department of Transportation. 2018.
6. Graduated with Highest Honors. UIUC. 2015.

SKILLS

- Languages: Python, MATLAB, C++, C, LaTeX
- Libraries: PyTorch, TensorFlow, ROS, Google OR-Tools
- Software: Fusion360, AutoCAD, Gazebo, SUMO