# Blake Warren Wulfe


**Personal Information**

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**Professional Experience**

Toyota Research Institute, Los Altos, California — April 2018 - Present

**Research Software Engineer, Machine Learning Research** — December 2020 - Present

- Researched learned methods for decision making including inverse reinforcement learning & reward learning, (offline) reinforcement learning, and transition model learning / prediction
- Published a first author spotlight paper (top 5%) at ICLR 2022 on comparing reward functions
- Published a paper at ICRA 2022 on planning-aware prediction methods
- Won the 2020 NeurIPS Procgen Challenge, a challenge evaluating the generalization and sample efficiency of reinforcement learning agents (first place in both tracks out of ∼500 teams)

**Research Software Engineer & Technical Lead, Prediction** — April 2018 - December 2020

- Led the design and implementation of the prediction system deployed on TRI vehicles (C++)
- Defined performance metrics for prediction, and implemented a system for computing them (C++)
- Led the development of a data pipeline for deploying learned prediction models (Python / C++)
- Deployed a neural network model for predicting the intent of other agents, which involved (i) dataset collection, (ii) model design, implementation, and training, (iii) run-time performance optimization, and (iv) deployment on vehicle as the primary intent prediction algorithm (Python / C++)
- Led a team integrating prediction output into high-level planning logic (C++)
- Defined the long-term technical direction of the team in collaboration with other team members
- Mentored team members and interns (assisted in defining, prioritizing, planning, executing projects)

Stanford Intelligent Systems Lab, Stanford University — April 2016 - December 2017

**Research Assistant**

**Multi-Agent Human Driver Modeling**

- Developed a multi-agent, generative adversarial imitation learning variant, which produced agents capable of driving realistically on a highway for approximately 20 seconds (Python)

**Automotive Scene Risk Prediction**

- Implemented a framework for deriving risk estimates of simulated automotive scenes (Julia)
- Trained domain adaptation, neural network models to predict collision risk (Python)

**Deep Reinforcement Learning of Collision Avoidance Policies**

- Developed a deep reinforcement learning system (using DQN) that solves for policies twice as fast as a baseline dynamic programming method while maintaining performance (Python)
- Built an interface to an aircraft encounter model to serve as the training environment (C++)

Adobe Research, San Jose, California — June 2017 - September 2017

**Research Intern**

**Adversarial Imitation Learning of Drawing Policies**

- Applied generative adversarial imitation learning to the task of learning to draw sketches from human examples, demonstrating improved sample efficiency over baseline methods (Python)

Accenture, Austin, TX — August 2014 - August 2015

**Business and Systems Integration Analyst**

**Education**

Stanford University — August 2015 - December 2017

M.S. Computer Science, Specialization in Artificial Intelligence

Vanderbilt University — August 2010 - May 2014

B.S. Computer Science, Cum Laude & Honors
Minors in Mathematics & Engineering Management

**Computer & Technical Skills**

**Programming Languages**: Python, C++
**Software**: Deep learning frameworks (Pytorch, TensorFlow)

## Publications

- **Blake Wulfe**, Ashwin Balakrishna, Logan Ellis, Jean Mercat, Rowan McAllister, and Adrien Gaidon. Dynamics-Aware Comparison of Learned Reward Functions. *International Conference on Learning Representations (ICLR)* 2022.

- Rowan McAllister, **Blake Wulfe**, Jean Mercat, Logan Ellis, Sergey Levine, Adrien Gaidon. Control-Aware Prediction Objectives for Autonomous Driving. *International Conference on Robotics and Automation (ICRA)* 2022.

- Raunak P Bhattacharyya, Derek J Phillips, **Blake Wulfe**, Jeremy Morton, Alex Kuefler, Mykel J Kochenderfer. Multi-agent Imitation Learning for Driving Simulation. *International Conference on Intelligent Robots and Systems (IROS)* 2018.

- **Blake Wulfe**, Sunil Chintakindi, Sou-Cheng T Choi, Rory Hartong-Redden, Anuradha Kodali, Mykel J Kochenderfer. Real-time Prediction of Intermediate-Horizon Automotive Collision Risk. *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)* 2018.

- Rachael E Tompa, **Blake Wulfe**, Mykel J Kochenderfer, Michael P Owen. Horizontal Maneuver Coordination for Aircraft Collision-Avoidance Systems. *Journal of Aerospace Information Systems (JAIS)* 2018.

- Rachael E Tompa, **Blake Wulfe**, Michael P Owen, Mykel J Kochenderfer. Collision Avoidance for Unmanned Aircraft Using Coordination Tables. *Digital Avionics Systems Conference (DASC)* 2016.