Adam Villaflor

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https://avillaflor.github.io/

EDUCATION

Carnegie Mellon University Fall 2018 – Spring 2024

- PhD in Robotics
- Thesis title: "Offline Learning for Stochastic Multi-Agent Planning in Autonomous Driving"

University of California, Berkeley Fall 2014 – Spring 2018

- MS in Electrical Engineering and Computer Science (GPA 4.0)
- BA in Computer Science with High Distinction in General Scholarship (GPA 3.94)

RESEARCH EXPERIENCE

Auton Lab and Argo AI Center, *Carnegie Mellon University* Fall 2018 – Spring 2024

Advisors: Jeff Schneider and John Dolan

- Investigated closing the loop between prediction and planning in AV systems by proposing P2DBM, which uses a pre-trained Transformer-based forecasting model autoregressively for fully-reactive planning in CARLA
- Proposed HOLOS, an algorithm for training a hierarchical cost-aware driving policy offline from counterfactual reactive simulation, which outperforms a SOTA IL approach in the reactive simulation setting in nuPlan
- Mitigated the optimism bias of prior offline RL sequence modeling approaches in stochastic environments by proposing SPLT, which learns separate CVAE-based policy and world models to do pessimistic planning
- Mentored an undergraduate and a graduate student researcher in developing RL algorithms for autonomous driving in simulation, both culminating in accepted conference papers

BAIR Lab, *University of California, Berkeley* Fall 2016 – Spring 2018

Advisors: Pieter Abbeel and Sergey Levine, Mentor: Gregory Kahn

- Researched and developed deep reinforcement learning algorithms for real-world robots, with a specific focus on sample efficiency, robot safety, and self-supervised learning
- Deployed novel off-policy reinforcement learning algorithms on an autonomous RC car that learned a combined CNN and LSTM model for online collision avoidance from an onboard camera

WORK EXPERIENCE

Developer Program Engineer Intern, *Google (Google Cloud Platform DPE Team)* Summer 2016

- Created a LSTM demo that can be used to generate its own novel text for Google's then-new scalable machine-learning platform Cloud ML
- Reported bugs and developer experience feedback to the Cloud ML team and worked with tech writers to improve the documentation and user experience for Cloud ML

PUBLICATIONS

A. Villaflor. "Offline Learning for Stochastic Multi-Agent Planning in Autonomous Driving." Diss. Carnegie Mellon University, 2024.

A. Villaflor, B. Yang, H. Su, K. Fragkiadaki, J. Dolan, J. Schneider. "Tractable Joint Prediction and Planning Over Discrete Behavior Modes for Urban Driving." In ICRA, 2024.

A. Villaflor, Z. Huang, S. Pande, J. Dolan, and J. Schneider. "Addressing Optimism Bias in Sequence Modeling for Reinforcement Learning." In ICML 2022.

I. Char, V. Mehta, **A. Villaflor**, J. Dolan, and J. Schneider. "BATS: Best Action Trajectory Stitching." In NeurIPS Offline RL Workshop 2021.

C. Killing, **A. Villaflor**, and J. Dolan. "Learning to Robustly Negotiate Bi-Directional Lane Usage in High-Conflict Driving Scenarios." In ICRA 2021.

S. Triest, **A. Villaflor**, and J. Dolan. “Learning Highway Ramp Merging via Reinforcement Learning with Temporally-Extended Actions.” In IEEE IV 2020.
A. Villaflor, J. Dolan, and J. Schneider. “Fine-Tuning Offline Reinforcement Learning with Model-Based Policy Optimization.” In NeurIPS Offline RL Workshop 2020.
G. Kahn*, **A. Villaflor***, P. Abbeel, S. Levine. “Composable Action-Conditioned Predictors: Flexible Off-Policy Learning for Robot Navigation.” In CoRL 2018.
G. Kahn, **A. Villaflor**, B. Ding, P. Abbeel, S. Levine. “Self-supervised Deep Reinforcement Learning with Generalized Computation Graphs for Robot Navigation.” In ICRA 2018.
G. Kahn, **A. Villaflor**, V. Pong, P. Abbeel, S. Levine. “Uncertainty-Aware Reinforcement Learning for Collision Avoidance.” Preprint 2017.

TEACHING

Teaching Assistant, *Computer Vision (CMU)* Fall 2020
Head Teaching Assistant, *Computer Vision (CMU)* Fall 2019
Teaching Assistant, *CS189: Introduction to Machine Learning (UC Berkeley)* Spring 2017

SKILLS

Languages: Python, C++, Java, SQL
ML/Data Science Frameworks: Pytorch, Numpy, Matplotlib, W&B, Tensorflow, TensorBoard, Scikit-learn, Pandas