ROBERT DYRO

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I am deeply committed to advancing the field of autonomous systems and machine learning applications through proven, effective research. My foremost objective is to identify and execute solutions that deliver substantial and meaningful results. I am driven by the pursuit of technical knowledge for real-world applications that push the boundaries of technology.

EDUCATION

Stanford University — Stanford, CA
PhD in Aeronautics & Astronautics Engineering, GPA 3.93 — 2020 - present
MS in Aeronautics & Astronautics Engineering, GPA 3.89 — 2018 - 2020

University of California, Los Angeles — Los Angeles, CA
BS in Aerospace Engineering, Minor in Philosophy, GPA 3.94, Summa Cum Laude — 2014 - 2018

RELEVANT COURSEWORK

Convex Optimization I & II ■ Reinforcement Learning ■ Meta-Learning ■ Large-scale Matrix Computations
CS 1, 2 & 3 ■ Principles of Robot Autonomy ■ Optimal and Learning-based Control ■ Decision Making under Uncertainty

EXPERIENCE

Graduate Student, Autonomous Systems Laboratory (ASL) at Stanford University — Stanford, CA

Stress Testing Autonomous Vehicles via Counterfactual Editing of Trained Behavior Models — 2023
- extracting learned behavior distribution for realistic counterfactual generation via efficient linear algebra sketching

Fast Online Intent Inference in Autonomous Driving — 2022
- developed a fast structured parametric behavior inference method for online behavior identification in autonomous driving

Second-Order Sensitivity Analysis for Bilevel Optimization — 2021
- 2nd order sensitivity analysis of optimization, enabling much faster optimization of bilevel/inverse/sensitivity problems

Control under Arbitrary Uncertainty using Particle Model Predictive Control — 2020
- implemented and experimentally evaluated consensus control particle MPC for control under arbitrary uncertainty

Convex Last-layer Meta-learning for Behavior & Physics-based Modeling — 2019
- incorporated constraints into the meta-learning model for structured learning to allow adding a priori modeling knowledge

PhD Intern, Cruise — San Francisco, CA
Machine Learning Acceleration - Architecture Optimization — June - September 2022

Research Intern, Toyota Research Institute — Los Altos, CA
Intelligent Driver Behavior Modeling using Human Interpretable Rules — June - September 2020
- embedded human logic within path planning using Signal Temporal Logic (STL) to capture human-interpretable specification

Student Researcher, TANMS at UCLA — Los Angeles, CA
Multi-Physics Dynamics Simulation in Computational Multiferroic Systems — 2017

TECHNICAL EXPERIENCE

Projects:

- *torch2jax* - zero-overhead PyTorch computation wrapping for JAX computation graph under JIT and autodifferentiation
- automatic short answer grading (NLP) via meta-learning using BERT and Google's T5 models
- from scratch realistic quadratic program solver implementation for CUDA optimizations exploration
- fair and robust machine learning via local explainability enforcement exploiting the LIME technique
- experimental graph autodifferentiation library for full sparse 1st & 2nd order matrix algebra differentiation
- large-scale parametric evaluation of stochastic control work on a high-performance computing (HPC) *Slurm* cluster
- experimentally evaluated lifted NNs, convex reformulation of deep NNs
- optimal driving and intersection collision avoidance via Monte Carlo Tree Search for partially observable planning
- model-free policy optimization reinforcement learning for drone control
- designed a remote-operated field electrical power system and data acquisition system for student hybrid rocket project
- teaching experience in introduction to computer science for scientific computation (Matlab) & introduction to electronics

Software Skills:

advanced project experience in Python, Julia, C++, C, Matlab ■ advanced project experience with JAX, PyTorch, TF, ROS
experience with embedded systems, Linux, HPC, Slurm, AWS ■ working knowledge of CUDA, Fortran, JavaScript

MISC

Aero & Astro Student Advisory Committee ■ LA Marathon ■ General Ham Radio License ■ PADI Assistant Instructor