HUANGYUAN SU

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EDUCATION

Carnegie Mellon University, United States *Aug 2022 - Nov 2023(Expected)*

- Master of Science in Machine Learning. GPA: 3.9/4.0.
- Research Assistant (Auton Lab). Teaching Assistant (10708: Probabilistic Graphical Models).

Nanyang Technological University, Singapore *Aug 2018 - Jun 2022*

- Bachelor of Science in Mathematical Sciences; Computing and Data Analysis Minor. Highest Distinction. 4.82/5.00. Dean's List (Top 5% GPA, Academic Years 2020-2021, 2018-2019).
- Full scholarship recipient (NTU Science and Engineering Scholarship).

University of California, Los Angeles, United States Summer School. *Jun 2019 - Aug 2019*

WORK EXPERIENCE

Research Assistant (Large Language Models, Self-Driving), Carnegie Mellon University *Aug 2022 - Dec 2023*
Supervised by Prof Jeff Schneider Work on a transformer/diffusion-based formulation to handle multimodality in imitation learning for driving while following natural language instructions. Our aim is to harness the power of language feedback as an additional source of supervision to enhance the feedback loop of conventional autonomy stacks.

Research Assistant (Robotic Manipulation), Carnegie Mellon University *Aug 2023 - Dec 2023*
Supervised by Prof Ruslan Salakhutdinov. Solve robotic control problems across tasks under domain randomization and robot morphologies (hand, dog, arm) by distilling classical optimization algorithms (MJPC) into visuomotor policies.

Research Intern (Computer Vision), Peloton Interactive, United States *Jun 2023 - Aug 2023*
Designed an one-shot skeleton-based action recognition method that (1) achieves SOTA performance on NTU RGB+D 120 and NW-UCLA; (2) gets a high accuracy on proprietary dataset. Significantly advanced the capability of *Guide* (a core product).

Machine Learning Engineer Intern (AI/ML Team), Apple *May - Aug 2021*
Derived insights using Spark as to how well the personalized Today feed in App Store is performing for our users across 150+ storefronts and identify opportunities for improvement. Used the insights to optimize apps recommended to users and built dashboards to monitor the performance of different recommendation algorithms.

PUBLICATIONS

Diffusion-ES: Generative Evolutionary Search with Diffusion Models for Trajectory Optimization
Brian Yang, Huangyuan Su, Nikolaos Gkanatsios, Tsung-Wei Ke, Jeff Schneider, Katerina Fragkiadaki. In submission.
We propose DiffusionES, a method that combines gradient-free optimization with trajectory denoising to optimize black-box non-differentiable objectives while staying in the data manifold. Diffusion-ES samples trajectories during evolutionary search from a diffusion model and scores them using a black-box reward function in the form of natural language, using LLMs.

Model-Based Planning with Stochastic Trajectory Prediction Models for Urban Driving
Adam Villaflor, Huangyuan Su, Brian Yang, John M. Dolan, Jeff Schneider. In submission.
We consider trajectory prediction approaches that leverage learned anchor embeddings to predict multiple trajectories, finding that they can parameterize discrete locally consistent modes representing high-level driving behaviors. We propose closed-loop planning over these discrete latent modes to tractably model the causal interactions between agents at each step.

Frustratingly Easy Regularization on Representation Can Boost Deep Reinforcement Learning *Qiang He, Huangyuan Su, Xinwen Hou, Yu Liu. 2023 IEEE Computer Society Conference on Computer Vision and Pattern Recognition.*

Reinventing Policy Iteration under Time Inconsistency.
Transactions on Machine Learning Research 2022. Lesmana, Nixie S., Huangyuan Su, and Chi Seng Pun.

AWARDS & COMPETITIONS

Bronze Medal, International Mathematics Competition (IMC20), UK *July 2020*
Achieved Bronze Medal in this global individual Olympics competition involving top universities including MIT, etc.

Honorable Mention, International Student Cluster Competition (ISC2020), Germany *Feb 2020 - June 2020*
Achieved Honorable Mention (4th place). Building HPC and AI applications using CUDA/OpenMP/Machine Learning.

SKILLS

Languages: Python (with PyTorch, Tensorflow, JAX, Caffe2), C/C++, shell scripting, GO, SQL, LaTex, R, etc. Others: CUDA programming, OpenMP/OpenCL, Linux, Android Application Development, embedded systems, etc.