Tristan Saidi

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Education

Columbia University — New York, New York
P.h.D. student in Computer Science — 2023–Present
Advisor: Matei Ciocarlie

Columbia University — New York, New York
B.S. in Computer Engineering, *Summa Cum Laude* — 2023
GPA: 4.10

Honors and Awards

Computer Engineering Award of Excellence — 2023

Summa Cum Laude Graduate from the Columbia School of Engineering and Applied Sciences — 2023

Columbia Engineering Alumni Association (CEAA) Scholar — 2022

Columbia Unversity Dean's List: Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022

Publications and Pre-prints

G. Khandate*, **T. Saidi***, S. Shang*, E. Chang, Y. Liu, J. Adams, "R×R: Rapid eXploration for Reinforcement Learning via Sampling-based Reset Distributions and Imitation Pre-training", *Submitted to RSS Special Issue: Autonomous Robots*, 2024.

G. Khandate*, S. Shang*, E. Chang, **T. Saidi**, Y. Liu, S. Dennis, J. Adams, "Sampling-based Exploration for Reinforcement Learning of Dexterous Manipulation", 19^{th} *Robotics: Science and Systems (RSS)*, Daegu, Republic of Korea, 2023.

Research Experience

Robotic Manipulation and Mobility (ROAM) Lab — New York, New York
Research Assistant, Department of Computer Science — 2022–Present

- Conducting research on machine learning for dexterous in-hand manipulation under Professor Matei Ciocarlie. Currently working on integrating sampling-based planning and reinforcement learning to enable learning of dexterous robotic skills
- Implemented learning-based motor adaptation algorithms that leverage observation history to reason about environment properties and improve Sim2Real transfer
- Performed system identification of a real robotic 5-fingered hand and trained policies in IsaacGym. Successfully achieved Sim2Real tranfer of Reinforcement Learning manipulation policies to a real 5-fingered hand
- Led a project centered around snake locomotion research, spanning mechatronics to motor learning algorithms. Successfully implemented torque sensing on a real robotic snake and studied the effect of torque sensing for reinforcement learning of snake locomotion

Bioelectronic Systems Laboratory — New York, New York
Research Assistant, Department of Electrical Engineering — 2021–2022

- Worked with optimization concepts to derive and help write the proof of convergence for the least squares cost function for a novel compressed sensing algorithm. Also implemented MATLAB code to generate figures and statistics for error and accuracy
- Programmed and debugged embedded C code for TI-CC2640R2F microcontroller on PCB

Teaching Experience

Columbia University Department of Computer Science New York, New York
Teaching Assistant, Department of Computer Science 2022

- Assisted in teaching a graduate Machine Learning class taught by Professor Nakul Verma. Course covered topics such as SVMs, Kernel methods, KNN, Dimensionality Reduction, Clustering, and more
- Held weekly office hours, graded homework assignments and exams, and answered Ed-Stem discussion questions from students

Skills

Technical Proficiency

- **Proficient:** Python, IsaacGym, Mujoco, PyTorch, Git, NumPy, Scikit-Learn, LaTeX, Matplotlib, Linux (Usage and Shell Scripting), C
- **Familiar:** C++, Java, SciPy, Matlab, Pandas

Relevant Courses

- Neural Networks and Deep Learning, Convex Optimization, Geometric Data Analysis, Foundations of Graphical Models, High Dimensional Probability, Machine Learning, Reinforcement Learning, Operating Systems

Projects

Exploring Adversarial Perturbations to Diffusion Models	2023
Examining the geometry of neural mode connecting loss subspaces	2023
On the Effect of Unsupervised Regularization for Image Classification	2023
Implementation of a functional scheduler and filesystem for Linux 5.10.182	2023
Implementation of a Finite Impulse Response (FIR) filter in Verilog	2021

Research Students Supervised

Ethan Matzner, Columbia B.S. Mechanical Engineering	2023 - present
Geoffrey Wu, Columbia B.S. Computer Science	2024 - present
Jamie Palmer, Columbia M.S. Mechanical Engineering	2024 - present

Selected Press

Time Magazine Best Inventions of 2023	Time Magazine
"Robot Hand Manipulates Complex Objects by Touch Alone"	IEEE Spectrum
"This robot hand can manipulate objects without seeing them"	The Robot Report
"Highly dexterous robot hand can operate in the dark—just like us"	TechXplore
"This agile robotic hand can handle objects just by touch"	Popular Science