Matthew H. Bronars

319 10th St. NE, Atlanta, GA 30311

mbronars@gatech.edu • (858) 790-2258 • https://bronars.github.io/

EDUCATION

Georgia Institute of Technology, School of Interactive Computing *May 2022 – PRESENT*
Master of Science: *Computer Science*
Concentration: Computational Perception and Robotics
Cumulative GPA: 4.0/4.0

University of California Berkeley, College of Engineering *Aug 2017 – May 2022*
Bachelor of Science: *Electrical Engineering and Computer Science (EECS) & Mechanical Engineering*
Commendations: Deans List (Fall 2020), Certificate in Design Innovation
Cumulative GPA: 3.69/4.0

Notable Coursework

Deep Learning, Machine Learning, Artificial Intelligence, Machine Learning with Limited Supervision, Human Robot Interaction, Multi-Robot Systems, Convex Optimization, Efficient Algorithms

RESEARCH EXPERIENCE

Graduate Research Assistant – *Danfei Xu*, Georgia Tech *Aug 2022 – PRESENT*

- Researching offline imitation learning algorithms for robot manipulation tasks. I focus on methods that are amenable to human robot interaction as I am interested in robots that can be deployed in human-centric environments.
- Currently studying diffusion policies and the role of classifier free guidance in the action generation domain.

Undergraduate Research Assistant – *Lydia Sohn*, UC Berkeley *Aug 2020 – May 2022*

- Automated analysis of stem cell data by implementing a pipeline for instance segmentation and object tracking
- Annotated and cleaned an internal training dataset then finetuned the parameters of a U-Net CNN

PROFESSIONAL EXPERIENCE

Machine Learning Intern – Symbotic *May 2023 – Aug 2023*

- Analyzed correlations between robot failures and structural locations. Wrote procedures for validation data collection.
- Designed, implemented, and deployed machine learning models for classifying structural failures.

Computer Vision Intern – Schlumberger Doll Research *May 2021 – Dec 2021*

- Built and trained a neural network for visual failure detection. Made a pipeline for semi-supervised data collection.
- US patent pending: Cable Damage Detection by Machine Vision

Robotics Intern – National Security Innovation Network *May 2020 – Sept 2020*

- Designed, specified, and constructed a prototype UAV based on constrains set by the Department of the Navy.

PAPERS

Legibility Diffuser

- Using diffusion model guidance, we selectively generate the most legible trajectories from a demonstration dataset.
- Our experiments show that increasing the guidance weight produces goal specific actions, and we find that decaying the guidance weight over the course of a trajectory is critical for success rate.

Learning to Discern – *CoRL Conference Paper (2023)*

- This is a method for filtering high quality demonstrations for behavioral cloning. We use contrastive losses to train an encoder on a small subset of labeled data.
- In our learned latent space, preference learning effectively discerns high quality demos from a batch of unlabeled data.

Legible Motion from Conditional Generative Models – *ICML Workshop Paper (2023)*

- We train a classifier to directly predict legible states, then use rejection sampling to produce legible trajectories from conditional, generative policies.

MISC

Graduate Teaching Assistant – Deep Learning & Deep Learning for Robotics *Aug 2023 – PRESENT*

- At Georgia Tech, I created an assignment on generative models (theory and coding) for the deep learning class.

Robomimic Development Team *Dec 2022 – PRESENT*

- Assisted in the implementation, benchmarking, and documentation of transformer based behavioral cloning.
- Currently adding parallel evaluation and implementing metrics/procedures for multi-task evaluation