

Undergraduate student major in Computer Science in Columbia University, with background in programming and intelligent system and research experience in neuroscience and neural data analysis



## Education

Columbia University Bachelor of Science Sep 2021 - May 2023

- ◆ Major in Computer Science, GPA 3.9
- ◆ Graduate level coursework: Artificial Intelligence, Machine Learning, Computational Aspect of Robotics, Deep Learning, Robotics Learning, Computer Vision, Theoretical Neuroscience
- ◆ Research Assistant at Paninski lab in Columbia Zuckerman Institute for neural data analysis

Bard College at Simons Rock Bachelor of Arts Sep 2018 - May 2021

- ◆ Undergraduate level Coursework: Algorithms & Data Structures, Java programming, Database, Web Programming, Linear Algebra, Multivariate Calculus
- ◆ GPA 3.9/4.0, earned Dean's List for 5 semesters, granted SR merit scholarship



## Skills

- ◆ **Programming languages:** Python, Java, C, JavaScript/HTML/CSS, SQL, R
- ◆ **Platforms/Framework:** Pytorch, Git/Github, Tensorflow, MySQL, Jupiter Notebook, JUnit, MongoDB



## Research Experience

### Density-based Neural Decoding for Neuropixel Recordings

- ◆ Developed a density-based approach for decoding to predict time-varying animal behavior from large-scale electrophysiology data collected by Neuropixel Probes
- ◆ Extracted density-based neural representation by incorporating uncertainty about spike assignments in the form of parametric distributions of spike features using highly paralleled MoG algorithms
- ◆ Applied the density representation to decode behavior, evaluated the decoder performance, and found it outperform previous decoding method using multi-unit thresholding
- ◆ Paper abstract admitted to Cosyne conference for poster presentation

### Analyze Nonlinear Embeddings of Behavioral Videos for neural decoding

- ◆ Extracted nonlinear behavioral embeddings from animal behavior videos using Variational Autoencoder
- ◆ Decoded extracted behavioral embeddings from electrophysiology recording with dilated Temporal Convolution Network to leverage the long-range temporal information
- ◆ Reconstructed behavioral frames from predicted behavior embeddings using a frame decoder and performed latent space traversal to examine its decoding quality

### Autonomous Bin Picking Robot Simulation

- ◆ Implemented perception and planning pipeline for robot grasping and bin picking tasks with Pytorch
- ◆ Trained a U-Net model for image segmentation and performed pose estimation using ICP algorithm
- ◆ Implemented grasping for simulated UR5 robot with inverse kinematics and used RRT algorithm for path planning to move the object without collision
- ◆ Implemented visual affordance based model to predict grasp locations directly from images and improved performance compared with classical models