Atiksh Bhardwaj

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Academics

Cornell University (Class of 2026) Engineering Dean's Honor List (Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024)
- Major: Computer Science in College of Engineering; GPA: 4.00 / 4.00; Pursuing Honors Program (Includes Research)
- Coursework: Algorithms, Reinforcement Learning, Robot Learning, Computer Vision, Machine Learning,, Discrete Structures, Computational Algebra, Honors Data Structures, Differential Equations, Linear Algebra, Multivariate Calculus,

Coursera - Stanford University and DeepLearning.AI's Machine Learning Specialization

Research (Google Scholar)

PoRTaL Group (2023 - Present) (Full-Time Undergraduate Researcher) (Prof. Sanjiban Choudhury): https://portal.cs.cornell.edu/

"MOSAIC: A Modular System for Assistive and Interactive Cooking" published at Conference on Robot Learning (CoRL) 2024 and International Conference for Robotics and Automation (ICRA) 2024
- MOSAIC is a modular architecture for home robots facilitating collaborative cooking tasks with users through natural language interaction, coordinating multiple robots, and employing large-scale pre-trained models alongside task-specific modules
- Applied human-motion forecasting algorithms and ideas from previous papers to a large system to enable active collaboration between robots and a human in a kitchen setting
- Implemented new vision based system for human pose tracking, point cloud generation, and object detection to automate the robot's human-motion forecasting without the need for motion capture systems
- Created protocols that actively motion plan based on the object detection system via FrankaPy for different tasks run by the robot such as handovers, reactive stirring, and table setting
- Best Paper Award at the ICRA 2024 VLNMN Workshop and Best Poster Award at the ICRA 2024 MoMa Workshop

"InteRACT: Transformer Models for Human Intent Prediction Condition on Robot Action" published at the ICRA 2024
- InteRACT is a novel architecture for collaborative human-robot manipulation, addressing the challenge of predicting human intents influenced by robot actions through leveraging large-scale human-human interaction data to pre-train a conditional intent prediction model and fine-tune it on a small human-robot dataset.
- Developed correspondence between robot arm and human arm using wrist and hand positions along with inverse kinematics for the Franka Emika Research 3 Robot using the FrankaPy library
- Programmed and modified model for conditional forecasting for both human-human and human-robot datasets using the Multi-Range Transformer (MRT) model
- Created the Collaborative Manipulation Dataset (CoMaD) containing human-human and human-robot interactions across 5 varied kitchen tasks extended from work on ManiCast

"ManiCast: Collaborative Manipulation with Cost-Aware Human Forecasting" published at the CoRL 2023
- ManiCast is a framework designed for seamless human-robot manipulation, which focuses on producing cost-aware human motion forecasts to enhance the planning performance of a robot arm in collaborative tasks.
- Created new data for training, created figures and edited final paper

Work Experience

Undergraduate Researcher at PoRTaL Group (Summer 2023, Summer 2024)

Teaching Assistant (TA) (2023 - Present)

Hold weekly office hours to help students with assignments, Develop new assignments for the course, and Grade exams/assignments throughout the semester
- TA for Robot Learning (Fall 2024), TA for Artificial Intelligence (Spring 2024), TA for Functional Programming (Fall 2023)

Brains4Drones Summer Internship (Summer 2022): https://brains4drones.com/

Developed computer vision and machine learning algorithms to help analyze field terrain and electricity poles to prevent wildfires.
- Created automatic panorama stitcher with optical flow on drone movement as a software solution for LIDAR maps
- Programmed ML algorithm to identify specific danger zones amongst wildfire prone areas such as ground conditions and situation regarding the electrical wiring
- All code built into GUI application for line workers to easily identify danger zones with the help of automated drone flight

Awards, Honors, and Competitions

Big//Red Hacks (2022)

Winner of Blockchain and Web Track sponsored by PI Network: NFTree / PI Network Blog: Big//Red Hacks Winners
- An open marketplace for users to purchase and grow trees, with attached NFTs that change in value based on the attributes of the tree including health, type, location, and more

Featured in Blogs/Media - Mathworks Simulink Blog: Simulink Award

Skills

- Proficiency: Java, C++, Python, Simulink (MatLab), OCaml, PyTorch, OpenCV, TensorFlow, Scikit-Learn, Windows, MacOS, Ubuntu, Arduino, Raspberry PI, Microsoft Office, Google Suite, Blender (3D Modeling + Video Editing)
- Languages: English (Native), Hindi (Native), Spanish (Fluent)