

Tasha Pais

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Education

Rutgers University

Sep 2020 - Dec 2021, Jan 2023 - May 2024

Bachelor of Science in Computer Science, Minor in Cognitive Science, GPA: 3.83

New Brunswick, NJ

Selected Coursework: Analysis of Algorithms, Systems Programming in C, Computer Architecture in C, Operating Systems Design in C, Functional Programming in Python, Computational Robotics in Python, Machine Learning in Python, Deep Learning with Pytorch, Neural Structure of Language, Advanced Topics in Language and Cognition, Independent Study in Computer Vision

Columbia University Fu Foundation School of Engineering

Jan 2022 - Dec 2022

Transfer Student in Computer Science, GPA: 4.0

Manhattan, NY

Selected Coursework: Engineering Blockchain Applications, Microeconomics, Competitive Programming in Python, Robot Learning

Skills

Languages: Python3, Java, C/C++, Typescript/Javascript, X86 Assembly

Technologies/Frameworks/Tools: PostgreSQL, MongoDB, Express.js, React, Node.js, Flask, Google OAuth, Pytorch Lightning, Cuda, Isaac Gym, AI2-THOR, Weights & Biases, Seaborn, Matplotlib, Ray, Grid.ai

Experience

Physics-Aware Research for Autonomous Computational Systems (PracSys) Lab

Jan 2024 - Present

Part-time Researcher

New Brunswick, NJ

- Led the design and implementation of 3D shape completion algorithm using text-conditioned inpainting and monocular depth estimation by adapting codebase to process new video input, achieving a 20% improvement in texture fidelity
- Reimplemented vision mamba algorithm from scratch by understanding core functions in expansive codebase
- Fixed a tensor manipulation mismatch between the expected and actual number of input channels provided to the conv1d layer and reported training accuracy of 74% in line with proposal

Columbia Robotic Manipulation and Mobility (ROAM) Lab

June 2023 - Aug 2023

Research Internship

Manhattan, NY

- Pioneered a co-training exploration strategy to autonomously guide robots in unstructured environments
- Achieved a 5% improvement on past benchmarks by piloting intra-category level object classification, kept running the exploration policy until the data buffer is fully populated, adding images to this buffer when a new pixel is revealed
- Created 12 steps for translation and rotation as numpy arrays, fixed collision detected by obtaining contact points and normals from Shapenet dataset in Isaac gym simulation environment [[code](#)]

Columbia Artificial Intelligence and Robotics (CAIR) Lab

June 2022 - Aug 2022

Research Internship

Manhattan, NY

- Improved framework for learning 3D localization and completion for the exclusive domain of hidden objects by implementing an expectation maximization algorithm on a gaussian mixture model, 80% faster than a naive search [[paper](#)]
- Solved issue of CLIP's relevancy extractor not working as a perfect baseline by subtracting the relevancy matrix for two images where the cabinet with our desired apple was opened and closed, effectively eliminating the irrelevant pixels outside
- Wrote script in RoboTHOR simulation environment for embodied agent to randomly collect viewpoints of objects when hidden and in view, natural language is queried into actions using pre-trained visual language model CLIP [[video](#)]

Projects

Fullstack Multi-user Blendr Blogging Platform | *React, Flask, Node.js, MongoDB, PostgreSQL, Google OAuth*

May 2024

GPT Eyes [[code](#)] | *YOLOv8, OpenAIWhisper, Apple Shortcuts*

May 2024

Robot Localization Implementations of Particle Filter and Extended Kalman Filter [[code](#)] | *Python, Matplotlib*

Dec 2023

Multiplayer Game Service using Socket Programming [[code](#)] | *POSIX for TCP, System calls in C*

April 2022

Honors

Deans List all semesters

May 2024

Columbia Lionhack 1st Place Arbitrum Track \$1500 prize [[award](#)]

April 2023

Dennis Walker Academic, JFK Medical Center Merit, Metuchen Computer Science Scholarships

June 2020

3x Concert Pianist at Carnegie Hall [[video](#)], Northshore Inline Marathon finisher (26.2 miles)

Sep 2016 - June 2020