Tasha Pais

tashapais.com

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Education

Rutgers University Sep 2020- Dec 2021, Jan 2023- May 2024
Bachelor of Science in Computer Science and Cognitive Science, GPA: 3.83 *New Brunswick, NJ*
Selected Coursework: Design and Analysis of Algorithms, Systems Programming in C, Formal Languages and Automata in Scheme, Computer Architecture in C, Operating Systems Design in C, Computational Robotics in Python, Machine Learning, Deep Learning

Columbia University Fu Foundation School of Engineering Jan 2022- Dec 2022
Transfer Student in Computer Science, GPA: 4.0 *Manhattan, NY*
Selected Coursework: Robotic Learning, Microeconomics, Engineering Blockchain Apps, Competitive Programming in Java

Experience

Physics-aware Research for Autonomous Computational Systems Lab (PracSys) Sep 2023- Present
Part-time Researcher *New Brunswick, NJ*

- Shape completion of object geometry from partial views using RGB-D sensors, combines monocular depth estimation with a text-conditioned inpainting model to output a seamless textured 3D mesh of multiple objects
- Experimented with MaskRCNNs, Diffusion Models, NERFs, learned computer vision research methodology

Columbia Artificial Intelligence and Robotics Lab (CAIR) July 2022- June 2023
Part-time Researcher *Manhattan, NY*

- Worked on 2 projects: Scaling Up Tactile Sensing Algorithm for Category Level Classification [code] and Extending Semantic Abstraction of 2D VLMs for Efficient Search of Hidden Objects [paper]
- Used modern ML tools: Pytorch Lightning, CUDA, Weights & Biases, NVIDIA Isaac Gym, AI2-THOR

Projects

Autonomous Robotics Simulator [code] | *Python, Numpy, Matplotlib* November 2023

- Improved path planning efficiency by 40% in complex environments using PRM and A* algorithms
- Integrated kinodynamic search tree to find trajectories for autonomous car to reach goal region with 89% accuracy

MNIST Classification [code] | *TensorFlow, Keras, Scikit-learn, Jupyter Notebook* October 2023

- Implemented logistic regression models and equivalent softmax models, analyzed l2 regularization and cross entropy loss, calculated negative log likelihood in forward pass
- Wrote script to compare hyperparameter settings on epoch number and regularization strength to improve test accuracy by 10%, improved pegasos implementation by preventing rewrite of support vectors at every iteration

Cryptographically Secure Quadratic Voting [code] | *Hardhat, Next.js, Solidity, Polygon Matic Testnet* December 2022

- Creatively solved poll time expiration issue in security design by preventing a block from being mined if there's no transaction, prevents sybil attacks by only passing address of eligible voter in factory contract

Skills

Languages: Python, Java, C/C++, Typescript, X86, R, HTML/CSS, JavaScript, LaTeX
Technologies/Frameworks/Tools: PyTorch Lightning, Ray, Weights & Biases, Git, NumPy, Matplotlib, Bash scripting, Pandas, PyBullet, CUDA, NVIDIA Isaac Gym, AI2-THOR, PostgreSQL, MongoDB, Mongoose, Authentication, Firebase, React Hooks

Honors

Dennis Walker Academic, JFK Medical Center Merit, Metuchen Computer Science Scholarships June 2020
Northshore Inline Marathon Finisher (26.2 miles) Sep 2016
3x Concert Pianist at Carnegie Hall Sep 2017- Feb 2021