Cael Yasutake

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Skills

Programming Languages: Python, C/C++, Matlab, Java
Tools: CUDA, PyTorch, TensorFlow, Scikit-Learn, ROS2

Experience

Research Assistant, A^2R Lab (Columbia University/Dartmouth College) – New York, NY May 2024 – Present
- Designed a novel inverse kinematics algorithm that outperforms current state-of-the-art systems by combining orientation-aware coordinate descent and Jacobian polishing. arXiv:2510.07514
- Implemented custom CUDA kernels to exploit block-, warp-, and thread-level parallelism to evaluate thousands of problems in parallel, achieving sub-millimeter and sub-degree levels of error.

Teaching Assistant, Columbia University – New York, NY Sept 2024 – May 2025
- Hosted 300+ hours of weekly office hour sessions for COMS W4701 Artificial Intelligence (Search Algorithms, Adversarial Networks, Probabilistic Modeling, Machine Learning).
- Held recitation sessions (lecture-based teaching), covering practice problems and reinforcing key AI topics for 400+ students

Research Assistant, Columbia University & IBM – New York, NY Sept 2024 – Dec 2024
- Co-developed optimization strategies to reduce computational load in Analog In-Memory Computing (AIMC) cores and Digital Processing Units (DPUs) under the mentorship of an IBM research scientist.
- Prototyped an adaptive partitioning algorithm using PyTorch to improve the accuracy and latency of computer vision models.

Software Development Associate, General Dynamics Information Technology – Remote June 2024 – Aug 2024
- Co-developed company-wide automation platforms for asset tracking and management, improving visibility and reducing manual labor.
- Curated and preprocessed datasets for LLM fine-tuning using Python automation and Hugging Face.

AI and ML Associate, General Dynamics Information Technology – Remote June 2023 – Aug 2023
- Developed prototype frameworks for multivariate time-series analysis, improving accuracy over previous single-variate models for beneficiary forecasts.
- Cleaned and transformed messy customer datasets using Python (Pandas, NumPy) for predictive modeling.

Projects

HJCD-IK: GPU-Accelerated Inverse Kinematics through Batched Hybrid Jacobian Coordinate Descent
github.com/A2R-Lab/HJCD-IK
- Open-source inverse kinematics library designed for fast real-time motion planning.

ShiBot-Inu: Reinforcement Learning for Walking Gaits github.com/caelyasutake/ShiBot-Inu
- Trained a custom-designed quadruped robot using reinforcement learning in NVIDIA's Isaac Sim and Isaac Lab.

Mobile Robot Navigation github.com/caelyasutake/mobile-robot
- Developed a simulated differential-drive robot with LiDAR-based SLAM to generate occupancy maps in dynamic environments using ROS and Gazebo.

Education

University of Pennsylvania – MS in Robotics May 2027
Columbia University – BS in Computer Science May 2025