David Young

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EDUCATION

University of Pennsylvania **Expected: May 2027**
Master of Computer & Information Technology (MCIT) Current GPA: 4.00
Relevant Coursework: Data Structures & Software Design, Computer Systems Programming, Artificial Intelligence, Deep Neural Networks

CUNY Queens College **Graduated: May 2025**
Bachelor of Arts, Applied Mathematics

PROJECTS

CHIRON — Cybernetic Hardware Interface for Robotic Operations & Networking **January 2026 - Present**
Independent Technical Project

- Co-developed a geometry-driven robot motor cortex in MuJoCo (~500 Hz) with damped least-squares inverse kinematics (1000 iter, 5mm tolerance) and a self-measuring gripper model that reads finger offset, pad height, and actuator range directly from the robot definition, eliminating hardcoded constants across arm configurations.
- Designed the pick-and-place control sequencer, including gripper-envelope collision checks, corridor clearance along planned paths, adaptive carrying-height search, grasp verification with auto-retry, and automatic decomposition of stacked scenes into executable sub-tasks.

BROTEUS — Behavior Recognition, Object Tracking & Environmental Understanding System **January 2026 - Present**
Independent Technical Project

- Co-developed an open-vocabulary perception pipeline integrating YOLO-World detection (87% confidence, 21 FPS on CPU), IoU-based multi-object tracking, and monocular depth estimation (MiDaS) feeding a four-criteria grasp affordance heatmap.
- Engineered the dual-hand gesture and animation recognition layer using MediaPipe (42 keypoints), 35-dimensional feature vectors with palm-orientation encoding for rotation invariance, and Dynamic Time Warping for speed-invariant temporal matching, with per-hand persistence to disk.

ATHENA — Autonomous Terrain & Hazard Exploration Navigation Agent **January 2026 - Present**
Independent Technical Project

- Implemented four interchangeable pathfinding algorithms (A*, Dijkstra, RRT, D* Lite) behind a unified stepper interface for a browser-based 3D rover autonomy simulator (React, Three.js), with real-time search visualization, cost heat mapping, and multi-waypoint mission chaining.
- Built a deterministic chunk-based terrain generator using seeded 3-layer fractal Brownian motion noise and spatial cell hashing for crater placement, with parameterized planetary profiles (Mars, Venus, Europa, Titan) that drive geometry, lighting, fog, and surface coloring from configuration data rather than code branches.

WORK EXPERIENCE

CUNY Queens College Physics Department — Undergraduate Research Assistant **April 2024 – September 2025**

- Built a full MATLAB pipeline for trajectory analysis of 10-500 lab-raised daphnia, handling data ingestion, denoising of raw positional data, and extraction of behavioral metrics from positional and temporal signals.
- Implemented statistical analysis across individual and collective motion, identifying that the majority of observed movement patterns are consistent with Brownian dynamics rather than more complex biological motion models.
- Presented findings as a research poster (hosted at david-j-young.com) as part of an ongoing collaboration with a biology research team working toward peer-reviewed publication.

HONOR/AWARD

2024 Queens College Summer Undergraduate Research Program Completion ($2000) **August 21, 2024**

SKILLS

Languages: Python, C++, C, Java, MATLAB, JavaScript, HTML | **Robotics & ML:** ROS 2 Humble, MuJoCo, Genesis, PyTorch, OpenCV, YOLO-World, MiDaS, SINDy, RL (PPO, SAC) | **Frameworks & Systems:** FastAPI, WebSocket, REST APIs, OAuth2, React, Three.js, Google APIs, Groq/Ollama LLM inference | **Tools:** Git, Linux