

Skye Toral

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Summary

AI & Robotics Researcher with a Master's in Computer Science and a strong foundation in full-stack and systems engineering. Experienced in architecting end-to-end AI pipelines, from motion-capture data collection and feature engineering (Python, PyTorch) to "digital twin" validation in Unity. Complements research experience with proven skills in building scalable full-stack applications (TypeScript, React, MongoDB) and a deep, practical understanding of operating system fundamentals (C, x86-64 Assembly) from kernel development.

Education

Master of Science in Computer Science

Northeastern University, Boston MA | Sept 2025 - May 2026

Bachelor of Science in Computer Science and Behavioral Neuroscience

Northeastern University, Boston MA | Sept 2021 - May 2025

Computer Skills

AI & Robotics: Python, PyTorch, Scikit-Learn, Unity, Computer Vision, Reinforcement Learning

Systems Engineering: C, x86-64 Assembly, Linux, Docker

Full-Stack Development: TypeScript (React), Express.js, Java, MongoDB, MySQL, GitHub

Experience

AI & Robotics Researcher II @ Piaggio Fast Forward

July 2024 - Present

- Engineered and validated machine learning models (PyTorch, Scikit-Learn) for human behavior prediction, analyzing spatial motion capture data to simulate robotic follower behavior.
- Architected an automated feature engineering pipeline for large-scale motion capture datasets, reducing data processing time by 50% and accelerating AI-driven analysis.
- Developed a "digital twin" simulation and visualization pipeline in Unity to test and validate model behavior, identifying key error modes and doubling model accuracy.

Software Engineer @ Brain ImPACT Lab

Sept 2023 - June 2024

- Developed a full-stack Typescript web service for neuroscience research, integrating third-party APIs (Fitbit, Twilio) and MongoDB for real-time, multimodal data collection.
- Designed and implemented machine learning pipelines to process and analyze a large structured data set of more than 100,000 brain magnetic resonance images, identifying key indicators of traumatic brain injury.
- Collaborated with researchers to ensure high-quality and well-documented code through rigorous code reviews, supporting technical validation efforts.

Projects

myOS - 64-bit Kernel

August 2025 - November 2025

- Built a 64-bit operating system kernel from scratch in C and x86-64 Assembly as a deep dive into low-level systems programming.
- Implemented core memory management features, including paging, a higher-half kernel, a page-based physical memory manager (PMM), and a kernel heap ('kmalloc'/'kfree').
- Engineered a preemptive, round-robin scheduler with context switching triggered by the PIT.
- Designed and initialized core CPU systems (GDT, IDT), handled hardware IRQs via the PIC, and created a basic 'int 0x80' system call interface.
- Wrote basic drivers (Serial, PS/2 Keyboard, Framebuffer) and a 'tar' parser to read files from an 'initrd'.

Dolphin Cove - Full-Stack Web Service

January 2025 - May 2025

- Developed a scalable real-time social platform using TypeScript, Express.js, MongoDB, and WebSockets.
- Engineered a React-based front-end with the YouTube API to support synchronized video playback and interactive user experiences.
- Implemented a comprehensive testing suite with Jest, achieving 100% code coverage for automated back-end validation.

Interests

Human-Robot Interaction (HRI), Game Development, Traveling, Cooking, Independent Music