Abhiram Nutakki

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Education

University of Waterloo Waterloo, ON

Bachelor of Applied Science in Management Engineering *Expected Grad Date: Jun. 2029*

- **Relevant Coursework:** Computer Programming, Linear Algebra, Circuits, Mechanics, Calculus II.

Experience

Software Engineer | *Magic Hour AI (YC W24)* Sep. 2026 – Present

- Prototyped **diffusion-based image and video generation**, integrating conditioning inputs, inference configuration, and generated-media processing into reproducible workflows.
- Reduced median generation latency by **28%** through inference configuration tuning while maintaining comparable visual quality.
- Reduced failed generation runs by **19%** by refining preprocessing, validating inputs, and improving error handling.
- Benchmarked image and video prototypes across **visual quality, generation latency, and output consistency**, comparing quality–latency tradeoffs to guide inference settings.

Autonomy Software Developer | *WARG, University of Waterloo* Sep. 2026 – Present

- Enabled reproducible camera tests by implementing a **Python/NumPy simulated camera** with deterministic RGB frames, monotonic timestamps, and initialization-state validation.
- Sequenced navigation and image capture with **py_trees memory-enabled behavior trees**, using non-blocking callbacks, frame-freshness checks, and capture timeouts to preserve mission progress and reject stale images.
- Expanded validation across **3 waypoint utilities** by adding **50 parameterized pytest cases** covering YAML parsing, coordinate boundaries, geospatial offsets, and clockwise sweep ordering.

Director | *Halton Game Jam* Oct. 2024 – Oct. 2025

- Delivered a game-development hackathon for **150+ participants** by directing event planning and coordinating collaborative game building and a final project showcase.
- Supported participant awards by coordinating a **$1,000 prize pool** sponsored by a **Y Combinator startup**.

Projects

Guitar-Playing Robot | *SO-101, Python, FastAPI, NumPy, Baseten* Hack the North

- Compiled phrases of **up to 64 notes** into SO-101 motion plans using **lift-first graph search** across **5 arm joints**, minimizing joint-travel cost over reviewed transitions.
- Implemented **3 pre-execution safety checks** for stale calibration, unsupported paths, and invalid joint targets; exposed validated motion previews through **FastAPI**.
- Integrated **Baseten audio assessment** with local signal analysis for bounded rehearsal revisions; validated software behavior with **343 offline checks** (340 Python, 3 Node.js).

Helium-Supported Robot | *C++, Python, Gazebo, JavaScript* 2026 – Present

- Built a **physical helium-supported prototype designed for autonomous operation**, using **2 flapping wings** and internal mass shifting; modeled steering, pitch, and altitude control in Gazebo.
- Implemented a **C++ dynamics plugin** applying buoyancy, aerodynamic drag, and estimated wing forces to articulated rigid bodies; exposed controls and telemetry through a **Python bridge**.
- Verified **5 behaviors** (floating, turning, climbing, descending, and coasting) with **21 validation checks** (14 simulation, 7 unit), including a zero-wing-force check for unintended propulsion.

VeloCity | *React, TypeScript, Python, scikit-learn*

- Developed a **React/TypeScript planning dashboard** comparing **20 Toronto cycling corridors** across **9 safety, equity, demand, and connectivity indicators**.
- Trained a **Random Forest relative-demand model** achieving **0.67 MAE**, reducing error by **39%** versus a 1.11 MAE median baseline; validated data and routing with **32 automated tests**.

Technical Skills

Languages: Python, C++, TypeScript, JavaScript, SQL, Lua, HTML/CSS
Frameworks/Libraries: React, Next.js, Node.js, FastAPI, NumPy, scikit-learn, py_trees, LeRobot
Databases/Cloud: PostgreSQL, Redis, Supabase, AWS, Azure, Baseten
Tools/Testing: Git, Docker/Compose, CMake, Gazebo, pytest, Vitest, GitHub Actions, CI/CD