Yeabsira Hawaz

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EDUCATION

Massachusetts Institute of Technology — Cambridge, MA
B.S in Electrical Engineering and Computer Science ; Minor in Musical Technology — *Class of 2026*
Coursework: Digital Systems Lab, Constructive Computer Architecture, Computation Structures, Circuits, Algorithms & Data Structures, Programming via Python, Programming via C/Assembly — GPA:4.8/5.0

EXPERIENCE

MIT Computer Science & Artificial Intelligence Laboratory — Cambridge, MA
Undergraduate Researcher, Computer Architecture Group — *01/2024-Present*
- Contributed to a project building an FPGA-based multicore system to accelerate sparse linear algebra
- Was fully responsible for designing and implementing the network-on-chip
- Used a 2D-torus topology with virtual channels for deadlock avoidance

MIT Media Lab — Cambridge, MA
Undergraduate Researcher, City Science Group — *09/2023-01/2024*
- Integrated GPT-4 with Python and LangChain, in order to dynamically produce agents for city-centric agent based modeling systems, drastically decreasing time to create said systems

Fundamentals of Python - MIT Course 6.101 — 09/2023-01/2024
Lab Assistant — *Cambridge,MA*
- Aided students in developing and debugging weekly programming labs such as an Audio Processor, a Symbolic Algebra Solver, and a Scheme Based Lisp Interpreter

Johns Hopkins Applied Physics Lab — Laurel, MD
Software Engineering Intern, Robotics Group — *06/2023-08/2023*
- Developed a novel methodology and platform for unit testing behavior tree-based MAVROS drones
- Wrote integration tests to emulate the preplanned actions of a MAVROS operated drone, decreasing time spent on workbench testing the drone after each update

Software Engineering Intern, Robotics Group — *06/2022-08/2022*
- Developed unit and integration tests, which increased code coverage on the project's autonomous drones from 25% to 97%
- Integrated DOD-wide system architecture with decentralized communication base with autonomous drones, allowing for external communication with our autonomous drones.

MIT Computer Science & Artificial Intelligence Laboratory — Cambridge, MA
Undergraduate Researcher, Computer Assisted Programming Group — *01/2023-05/2023*
- Developed a tool utilizing OpenAI's Python API that dynamically generates Python methods based on user queries

PROJECTS

Holoforge: A Gesture Controlled 3D Model Viewer — 10/2024-Present
- Designing and building a gesture contorlled 3D renderer with a custom-built graphics pipeline and rasterization process on a Xilinx Urbana FPGA board using SystemVerilog
- Enabled flexible 3D object loading over UART and leveraging parallelism and pipelining to attempt to render graphics at 720x480 resolution at 50 fps

snorOs(Hobby Operating System) — 8/2024-Present
- Designing and implementing a custom monolithic, ring 0, single-tasking kernel for x86 processors
- Developing a bootable OS using C, Qemu, x86 assembly, GRUB2, and GNU dev tools, with working custom graphics and keyboard drivers

SuperScalar Processor — 5/2024
- Designed and implemented a two-wide superscalar RISC-V processor in Bluespec with a branch-target buffer (BTB)
- Synthesized and ran the processor on a Urbana FPGA Board, trained against the MNIST Dataset 15% faster than a base line pipelined processor

TECHNICAL SKILLS

Languages: Verilog, Bluespec, C/C++,RISC-V Assembly, Python, ROS, x86 Assembly
Developer Tools: GIT, Docker, VIM, Jupyter Notebook, Linux, GCC, Make, VMware, Qemu
Hardware/Design: FPGA Development, SPI, UART, PCB Layout, Digital Circuit Design, Embedded Systems, Memory Management, Timing Analysis