Nathnael (Nati) Bekele

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Education

The University of Chicago, Chicago, IL
Bachelor of Arts in ***Computer Science focusing on Quantum Computing and Computer Systems*** expected June 2025.

Thesis: Benchmarking sliding and parallel window decoding for CSS qLDPC codes with BP-LSD inner decoders.

Honors: Winter Tech Showcase Best Overall for GuessTheWiki (2024), University of Chicago Advanced Scholar (2024), Dean's List (2021/22), Odyssey Scholar.

Technical Skills

Programming Languages: Python, C, JavaScript, HTML/CSS, C++17/20, Bash, SQL.
Libraries: [Python]: Flask, Django, Jinga, Cirq, Qiskit, Pytest, Numpy, Pandas, Multiprocessing, Threading, [JavaScript]: React, Socket.Io, Express, d3
Tools: Git, Linux, Docker, Neovim, VsCode, Gdb, Tmux, Sqlite.
Interests: Library and Backend Development, Quantum Software, Computer Systems, High-Performance Computing.

Experience

Meyer's Group (Astrophysics Research Group at the University of Chicago) Chicago, IL
Research Assistant focusing on Computer System Development September 2024 – Current
Focusing on system development for sensors to be used in the Wilkinson Microwave Anisotropy Probe satellite.

- Implemented new cross-file locks for shared memory used by sensors with Python to improve system robustness.
- Implemented system-wide sensor status check, terminate, and restart protocol to ensure sensors are always functional while the device is in use.
- Implementing safe data writing via UDP for infrared cameras to prevent network and system crashes.
- Designing and implementing calibration system for the infrared cameras to interpret data across different ambient temperatures the sensors experience during launch.

Infleqtion (Quantum Software and Hardware Company) Chicago, IL
Quantum Software Engineering Intern in the Compiler Team June 2024 – August 2024
Focused on developing testing, linting, and formatting tools, improving the website, and quantum computing.

- Developed measurement and classical control conversion between Pytket and Cirq expanding circuits handled by the Superstaq compiler.
- Implemented cancelation for quantum jobs sent to different vendors reducing the cost of job submission for users.
- Reimplemented non-deterministic algorithms to catch bad user inputs, and avoid test failing for random seeds.
- Enhanced security of the Superstaq website with password recovery, email validation, and deprecated password hash handling using Flask.
- Developed custom Pylint plugins to enforce code styling consistencies and catch typing errors.
- Implemented Github workflows to improve continuous integration to a research repository.

University of Chicago Biological Science Division Chicago, IL
Student Data Analyst and Programmer November 2023 – September 2024
Focused on automating the department's fiscal and analytical work.

- Developed multithreaded data backup software with version checks and OAuth using TKinter, Boxsdk, and Python that handles multiple folders and files simultaneously to automate manual and tedious backup processes.
- Automated department's publication tracking with Flask web software to save more than 5 hours per week.
- Implemented web scraper with Selenium and Python to fetch 260 data points to automate manual copy-pasting.

Personal Projects

- **localgit (*Python*):** Command line tool to simultaneously manage multiple local git repositories.
- **GuessTheWiki (*Flask, React*):** Wikipedia article title guessing web game with multiplayer gameplay.
- **licensepy (*Python*):** Python dependency license check library with recursive dependency handling for pip.
- **ampy (*C++*):** Python programming language with Amharic keywords. (In Progress)