Nathnael (Nati) Bekele

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Education

The University of Chicago — Chicago, IL
Bachelor of Arts in **Computer Science (Focus: Computer Systems)** — June 2025
Honors: Odyssey Scholar (2021-25), Winter Tech Showcase Best Overall for GuessTheWiki (2024), University of Chicago Advanced Scholar (2024), Dean's List (2021-22).

Technical Skills

Programming Languages: Python, C, JavaScript, C++, Rust, Go, HTML/CSS, Bash, SQL.
Frameworks &Libraries: Flask, Django, FastAPI, Jinja, Cirq, Qiskit, Pytest, NumPy, Pandas, Multiprocessing, Threading, Asyncio. React, Socket.IO, Express, D3.
Databases: SQLite, PostgreSQL, MongoDB.
Tools & Platforms: Git, Linux, AWS, Docker, REST API, uv, pip, npm, gdb, perf, Tmux, OAuth, JWT.
Focus Areas: Open Source, Backend & Library Development, Computer Systems, HPC, Operating Systems.

Experience

Meyer's Group (Astrophysics Research Group at the University of Chicago) — Chicago, IL
Research Assistant- Computer System Development — September 2024 – Current
Developing sensor and control systems with Python for the balloon-borne cosmic background radiation experiments.
- Developed fnctl-based locks for safe shared memory access across Python processes, achieving 0 data races.
- Implemented a shared memory lookup table for Python's ShareableList, speeding up access from ~20 ms to ~10 μs.
- Engineered safe, multithreaded image capture to synchronize 4 cameras, cutting timing variation from ~10s to ~1s.
- Optimized image transmission with UDP + bz2 compression, reducing network and storage load by ~30%.
- Built a Tkinter-based desktop app to filter, edit, and browse images, saving 2+ hrs of debugging per week for researchers.
- Profiled curses-based terminal interface with cProfile to identify and fix memory leaks, reducing CPU usage by 40%.

Infleqtion (Quantum Software and Hardware Company) — Chicago, IL
Quantum Software Engineering Intern → Consultant, Compiler Team — June 2024 – August 2025
Contributed to quantum compiler tooling, including testing infrastructure, code formatting, and website improvements.
- Designed control and measurement conversion between Pytket and Cirq, broadening circuit support in the compiler.
- Introduced user-requested job cancellation, reducing wasted compute and improving submission workflow.
- Enhanced security with Flask password recovery, email validation, and legacy hash support, resolving all account errors.
- Improved non-deterministic ACES algorithm with seeding for reproducibility and debugging, reducing flaking tests to 0.
- Created Pylint plugins to enforce code style and detect typing issues, ensuring type-safe, consistent code across codebase.

University of Chicago Biological Science Division — Chicago, IL
Student Data Analyst and Programmer — November 2023 – June 2025
Automated fiscal and analytical workflows for the department.
- Built a multithreaded Tkinter app with OAuth and version control to automate backups to Box, saving ~2 hours weekly.
- Implemented a Flask web app that automated faculty publication tracking, cutting 5+ hours of weekly manual data entry.
- Automated NIH-Reporter data preparation and analysis using Pandas for funding reports, saving ~2 weeks per funding cycle.
- Engineered a Selenium web scraper, extracting 300+ faculty award data points to eliminate ~ 3 days of manual work.

Personal Projects

- **Erys (Python, Open Source):** Terminal interface for creating, editing, and executing Jupyter notebooks
  - Built with custom Jupyter kernel discovery and async consumer/producer architecture.
  - Published on PyPI with 4,700+ downloads and 120+ stars on GitHub.
- **GuessTheWiki (Flask, React, Postgres)**: Multiplayer Wikipedia guessing game.
  - Leverages NLTK to score sentence relevance and generate progressive hints.
  - Implemented real-time WebSocket multiplayer; deployed online at guessthewiki.com.
- **licensepy (Rust, Open Source):** CLI tool for Python dependency license checks and license header formatting.
  - Supports multithreaded scanning for large projects.
  - Published on PyPI with 3,300+ downloads and adopted in checks-superstaq by Infleqtion.