# Samuel Asare Tawiah

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## EDUCATION

**Cornell University** — Ithaca, NY
*Bachelor of Arts in Computer Science* — *Aug. 2023 – May 2027*
**Honors:** Milstein Program in Technology and Humanity Scholar, Nexus Scholar
**Relevant coursework:** Object-Oriented Programming & Data Structures, Functional Programming, System Design, Web Design & Programming, Backend Development, Discrete Structures, Caluculus 1 & 2,

## EXPERIENCE

**Undergraduate Research Assistant** — May 2024 – Present
*Assistant Professor William Lai, Department of Molecular Biology and Genetics* — *Cornell University*
- Contributing to the Computational team in Pugh's Lab, focusing on developing predictive models to explore the relationship between motif sequences and protein domain families using high-resolution chromatin binding profiles.
- Preprocessed chromatin data using Pandas and NumPy for efficient manipulation and numerical operations.
- Converted chromatin datasets into HDF5 format with H5py for optimized storage and retrieval.
- Employed one-hot encoding for DNA sequences and building a machine learning model with Scikit-learn to predict motif-domain associations.
- Visualized data trends and model performance using Matplotlib, effectively communicating results to the research team.

## PROJECTS

**RideShare-X** | *Python, Flask, SQLAlchemy, Docker, Google Cloud, SwiftUI, Postman, AWS* — GitHub
- Developed a fully functional iOS app with **Google SSO** tailored for Cornell University students, facilitating easy and cost-effective transportation.
- Deployed a **RESTful API** with **Docker** & **Google Cloud**, storing ride and user data in **SQLAlchemy** and images in **Amazon S3**. Implemented comprehensive CRUD operations via **Flask**, capable of handling over **1,000 requests per day** with **94.9% uptime**.
- Utilized **Gunicorn** for network traffic management, employed **HTTP session tokens**, **OAuth2** & **OIDC** for secure user authentication. Conducted rigorous testing with **Postman**, optimizing API response times by **30%** and ensuring efficient concurrent request handling.

**Active Pulse** | *React, HTML, CSS, Javascript* — GitHub
- Developed a mobile-responsive blogging website designed to help users track workouts, set fitness goals, and stay motivated on their fitness journey.
- Utilized **React Hooks** (**useEffect**) for state management and dynamic updates.
- Implemented features for **creating, deleting, and managing** blog posts to allow users to share and read motivational content.

**Interactive image selection App** | *Java, Swing, GUI* — Youtube
- Enhanced image selection application with an "intelligent scissors" tool to trace edges using **Dijkstra's shortest path algorithm**, built with Java.
- Developed **polymorphic selection tools**, allowing users to switch between straight-line and edge-following modes.
- Extended **SwingWorker** to maintain responsive GUI during intensive calculations with a progress bar and cancellation option.

## TECHNICAL SKILLS

**Languages**: Java, Python, JavaScript, TypeScript, HTML/CSS, SQL, OCaml
**Frameworks/Libraries**: React.js, Node.js, SQLAlchemy, Flask, Django, Next.js, Framer Motion, Tailwind CSS, NumPy, Matplotlib, scikit-learn, Pandas
**Tools/DevOps and Clouds**: AWS, Docker, Google Cloud, Microsoft Azure, Linux, Git, Postman, VSCode, IntelliJ