Christian Nyamekye

linkedin.com/in/christian-k-nyamekye | github.com/ChristianNyamekye | christian.k.nyamekye.26@dartmouth.edu | 603-349-0531
christiannyamekye.com | 3866 Hinman, Hanover, NH 03755

EDUCATION

Dartmouth College, Hanover, NH August 2022 – June 2026 *Bachelor of Arts:* Computer Science and Engineering

♦ **Honors/Awards:** Jackson Prize for Innovation in Engineering by Thayer School of Engineering, Dartmouth College

♦ **Relevant Coursework:** FullStack Web Development, Software Design and Implementation, Foundations of Applied Computer Science, Data Structures and Algorithms, Systems Engineering, Machine Learning and Statistical Data Analysis.

Research

♦ **Gaze-Aware Reading-aid for the Browser:** GARB is an attention improver and a research tool. GARB helps us learn how people read online and how we can improve our comprehension and reading attention. **Research Mentor:** Tim Tregubov, Senior Lecturer in Computer Science, Dartmouth College

Extracurriculars: Digital Applied Learning and Innovation, National Society of Black Engineers, ColorStack, Codepath.

Tools: Git, IntelliJ, Visual Studio Code, Pycharm, Warp, Jupyter Notebook, Replit, Google Colab, Arduino, Adobe Photo Studio.

Proficient: C, HTML, SCSS, Java, Python, JavaScript, Swift, Flask, React, *Proficient in* Bash

Familiar with: Firebase, MongoDB, Docker, Typescript, and C++.

Technical Skills: SolidWorks; Qiskit's Framework, 3D-Printing, DCS, CNC Machining, CNC Laser Cutting, CNC Vinyl Cutting, Glow-forging

RELEVANT EXPERIENCE

Android Primary Flight Display Development Team, Dartmouth College, Hanover, NH, Project Intern **January 2024 – June 2024**

♦ Spearheaded the development of a robust Primary Flight Display system in DCS World using **Lua**, creating realistic flight scenario simulations and ensuring high accuracy and reliability in presenting critical aeronautical information such as altitude, thereby enhancing pilot decision-making processes.

♦ Integrated real-time navigational and airspace data using ForeFlight and C programming, producing a more intuitive and user-friendly interface that enhances situational awareness and aligns with advancements in operating systems and flight display technology.

♦ Engineered communication protocol using TCP/IP and UDP within the PFD system in optimizing real-time data synchronization and system responsiveness, significantly elevating the PFD's data transfer reliability and efficiency.

Digital Justice Lab, Dartmouth College, Hanover, NH, Research Assistant **January 2023 – December 2023**

♦ Pioneered the design and development of a programmable knitting machine by repurposing a vintage electronic machine with AYAB, achieving a 70% increase in operational efficiency and enabling the production of complex, high-precision textile patterns.

♦ Conducted comprehensive training sessions for 13+ students, significantly enhancing their proficiency in Arduino programming and Adobe Photoshop, and providing specialized tutorials on advanced knit data visualizations, leading to a 40% improvement in project complexity and execution.

♦ Developed extensive and precise documentation that became essential tools for over 25 artists, engineers, and innovators, facilitating the implementation of innovative knit textile projects and contributing to the submission of 10 new lab projects, focusing on environmental impact and cultural heritage preservation.

IBM - Qiskit Global Summer School, Remote, Lab Student **July 2023 – August 2023**

♦ Built and implemented 10+ quantum circuits with Grover's and Shor's algorithms; leveraged Qiskit's Terra, Aer, and Ignis libraries for programming

♦ Gained hands-on experience by executing and analyzing 10+ quantum programs on both simulator backends and real IBM quantum devices.

♦ Networked with a diverse global community of more than **4,000+** developers, researchers, and students to solve quantum computing problems

♦ Spearheaded a team of 4 (Quantum Exhaustion, #29) for the optional Qiskit final project and showcase: simulating ground state energies of molecules

PROJECTS

♦ **Biblio,** *FullStack Development*

- ➢ Spearheaded the design and development of a robust backend API using **Node.js** and **Express**, implementing routing, middleware, and RESTful endpoints to manage platform functionalities. Optimized database interactions with **MongoDB**, ensuring efficient data retrieval, storage processes, and data integrity, and utilized AWS for deployment to ensure high availability and scalability.
- ➢ Collaborated closely with the frontend team to build responsive and intuitive user interfaces using **React** and Mantine, contributing to a highly engaging user experience. Integrated third-party services such as Google Books API to enrich the platform's functionality, and coordinated with UI/UX designers to ensure a cohesive design.

♦ **Search Engine Development,** *Software Development*

Developed a high-performance search engine in C, integrating a **Crawler, Indexer**, and **Querier**. Incorporated multi-threading to optimize search results and query processing. Leveraged robust data structures, including hashtables and counters, to manage document frequency data and ensure accurate search result ranking. Conducted thorough testing and debugging to ensure system reliability and accuracy

♦ **Game Development,** *Network Programming*

Spearheaded the development of server-side mechanics for a multiplayer maze navigation game in C, utilizing grids, hashtables, and counters to manage game state, player positions, and item distribution. Integrated features to support up to 26 players, including real-time updates and dynamic game state handling. Engineered network communication protocols using socket programming, enabling robust client-server interactions. Optimized message parsing, player movement algorithms, and dynamic game state updates to ensure seamless and responsive gameplay. Implemented features for player ID assignment, random spawn locations, and game session management.

♦ **Part of Speech Tagger & Huffman Encoding,** *NLP & Data Compression*

Implemented a Java application to identify parts of speech in sentences using the Brown Corpus and hidden Markov models (HMM), facilitating linguistic analysis and natural language processing applications. Implemented another Java app with Huffman Encoding algorithm for lossless data compression of text files. Leveraged TreeMap for frequency counting, PriorityQueue for constructing Huffman trees, and bitwise operations for optimal encoding and decoding, resulting in storage savings and improved data transmission efficiency.

LEADERSHIP EXPERIENCE

♦ **Undergraduate Advisor,** Promotes inclusive and supportive communities that enrich residents' intellectual, cultural, and social development.

♦ **Executive,** Leads a pre-professional body that helps primarily Black students to succeed at Dartmouth through networking, mentorship, and professional development opportunities.

♦ **Treasurer,** Collaborates with a student team to design and build an electric/hybrid car for annual competition in the Formula Hybrid Race.

♦ **Teaching Assistant,** CS 10: Mentors and supports 10+ emerging computer scientists at Dartmouth, offering both academic in DSA and emotional guidance to foster their development.

♦ **Technician,** Install, configure, maintain, and troubleshot proprietary software in Dartmouth workspaces to ensure seamless academic operation.