

# Biruk Molla

717-203-3783 | mollabiruk63@gmail.com | [www.linkedin.com/in/birukmolla](https://www.linkedin.com/in/birukmolla) | [birukm3.github.io](https://birukm3.github.io)

## EDUCATION

University of Notre Dame | Notre Dame, IN

Graduation-May 2027

Bachelor of Science in Computer Science

GPA: 3.6

**Relevant Coursework:** Operating Systems, Data Structures, Discrete Math, Computer Architecture, Fundamentals of Computing

## TECHNICAL SKILLS

**Programming Languages:** C, C++, Python, MATLAB, JavaScript, TypeScript, HTML5, CSS

**Frameworks & Tools:** React.js, React Native, Flask, Firebase, AWS(S3, Lambda, DynamoDB, API Gateway, SQS, EC2), MongoDB, Tailwind CSS, Git/GitHub, Roboflow, Postman, OpenCV, PyTorch

**Software:** Visual Studio, Linux, macOS, SolidWorks/CAD, Raspberry Pi OS, MS Office(Word, Excel, PowerPoint)

## RELEVANT EXPERIENCE

**Research Assistant** | Ann Arbor, MI

September 2025 - Present

*Dr. Robert Dick and Dr. Sharon Hu, University of Michigan*

- Utilized **Abaqus** and **CalculiX** finite element solvers to model stress relaxation and deformation, with **Python scripts** extracting stress and displacement data from ODB files for analysis.
- Developed a **C++ pipeline** that integrates **3D geometry processing tools (PCL, CGAL)** to automate **mesh generation**, cut modeling, and stress deformation visualization.

**Research Assistant** | Notre Dame, IN

December 2024 – June 2025

*SaNDwich Lab, University of Notre Dame*

- Engineered an AI-powered chatbot integrating a **React**-based front-end with a **Python FastAPI** backend and **Ollama LLM**, gaining foundational exposure to machine learning fundamentals, model integration, and prompt engineering

**Visa Fintech Foundation Program** | Notre Dame, IN

September 2024 – January 2025

- Explored fintech career opportunities, focusing on financial inclusivity, sustainability, and advancements in technologies such as **machine learning**, **AI**, and **data analytics**.
- Gained insights into fintech trends like blockchain, payments, and digital currencies through weekly sessions led by Visa subject matter experts and Notre Dame alumni.

## PROJECTS/AWARDS

**HB00 Robot - Autonomous Mobile Robot**

Raspberry Pi OS, Python, OpenCV, Roboflow, SolidWorks

- Designed, built, and programmed a **fully autonomous robot** from scratch including mechanical 3D-printed structure, electrical systems, motion control, lighting, sound, and onboard display
- Implemented a singed integrated control system on **Raspberry Pi**, coordinating motor control, LEDs, servo gestures, sound playback, and display animations through **Python-based scripts**
- Built a computer-vision navigation system using a **Pi Camera** and pre-trained model (with custom numeric detection) to track road boundaries, detect turn/stop signs, and autonomously follow a printed course

**SnapBite**

Python, React Native, Expo, AWS Services, Roboflow

- Created a mobile app using AWS Amplify authentication and a fine-tuned YOLOv8 model to identify meals from user uploaded photos and retrieved nutrition data via the USDA Nutrition API
- Fine-tuned a YOLOv8 model with **294** labeled images in Roboflow to detect and classify **3** Ethiopian dishes
- Built a serverless backend using AWS S3 and Lambda to process uploaded images, run model, and return nutrition results

**Honorable Mention Hesburgh Libraries Hackathon** | Notre Dame

April 2025

- Awarded a total of **\$750**, **1<sup>st</sup>** place from CS for Good for developing a web application that promotes local gardening and sustainability through donations, educational guides, and social tools using **React**, **Firebase**, and **Tailwind CSS**

## LEADERSHIP

**Wabruda** | Notre Dame, IN

March 2024 – Present

*Vice President*

- Oversaw a team of **10+** executive board members to plan and execute key initiatives aimed at advancing diversity on campus
- Organized and led **7** major campus-wide events, attracting over **300** participants, that promoted awareness of cultural issues and fostered open dialogue.

**National Society of Black Engineers** | Notre Dame, IN

March 2025 – Present

*Webmaster*

- Maintained and updated the chapter's official website, ensuring content accuracy and functional integrity across platforms.
- Manage digital presence by coordinating timely updates to event pages and announcements for over **100+** members

## ADDITIONAL SKILLS/Clubs

**Languages:** Fluent in English, Amharic, and Ge'ez

**Clubs:** Color Stack Notre Dame Chapter, Black Business Association of Notre Dame, CS for Good, and Quant Club