

Ignas A. Kamugisha

✉ ignas@case.edu || in in/ignasxv || 🌐 ignasxv.com

EDUCATION

Case Western Reserve University. *Cleveland, OH*

Expected graduation: May 2027

Bachelor of Science, Computer Engineering (sophomore)

GPA: 3.7

- **Coursework/Concepts:** Data Structures, Operating Systems, Concurrent Programming, Object-Oriented Programming, Calculus, Logic Design and Computer architecture, High-Performance computing

UWC Robert Bosch College. *Freiburg, Germany*

2020 - 2022

International Baccalaureate Diploma. Math, Physics & Visual arts

- **Coursework:** IB High-Level Physics & Mathematics Analysis and Approaches
- **Activities :** President of Mechatronics Club

SKILLS

Languages+ Java, C/C++ (intro Arduino), Python, TypeScript, Bash, *HTML/CSS*, Verilog
Frameworks/Libs Java-FX, JUnit, ReactJs, ExpressJS, TailwindCSS, NodeJs, Socket.IO, Svelte & Svelte-Kit
Other Open-Processing, IntelliJ IDEA, VS-Code, RaspBerry Pi, ESP32, Git & GitHub

TECHNICAL EXPERIENCES & PROJECTS

Probabilistic estimation of constants

Jun 2021 - August 2021

Research Fellowship | Python, Sci-Kit learn, Pandas, Jupyter Notebook

Fellowship

- Explored and optimized probabilistic estimation algorithms.
- Authored a research paper on the probabilistic behavior of mathematical constants i.e Pi and e, integrating statistical analysis and computational methods.
- Awarded \$6,000 summer research preparatory fellowship.

MathSafari Kits – Math/Science Interactive Learning Hardware interface

June 2024 - August 2024

Developer | ReactJS, NodeJS, Arduino, Socket.io, ExpressJS, TailwindCSS, Git & github

- Designed a hardware interface, integrating analogy sensors with a NodeJS backend and ReactJS frontend
- Implemented serial communication for seamless hardware-software interaction, allowing students to experiment with variables and visualize results instantly.
- Enhanced team collaboration by developing virtual hardware using JavaScript and Arduino CLI, enabling remote development and testing without physical hardware.
- Accomplished real-time visualization of math and science concepts for intuitive learning, as measured by enhanced student engagement with interactive lessons.

Automatic Device for High Voltage Switching

2019 - 2022

Microcontrollers Programming | C/C++ (Arduino), Circuit Design

- Designed and programmed an ESP32-based system to automate high voltage systems, specifically targeting remote areas with no IoT coverage.
- Integrated analog and digital sensors for monitoring electrical parameters, enabling real-time adjustments based on system load and conditions.
- Embedded GSM modules for remote communication and control, for areas with unreliable internet.
- Successfully deployed the system in 2 schools and churches, improving operational efficiency and reducing manual intervention.

DigiCard Technologies – Professional Contact Exchange Platform

May 2023 - February 2024

Startup Development | JavaScript, NFC Technology, Sanity, Headless CMS, Svelte & Svelte-kit

- Implemented just-in-time client-side generation of contact cards, minimizing memory usage and backend load.
- Utilized ESP32 to create custom hardware for programming contact information into NFC cards
- Utilized spreadsheet as a backend for rapid development, enabling product launch within two weeks. Later, it migrated to a headless CMS- Sanity, allowing multiplatform data rendering.
- Secured distribution deals with three institutions, validating the platform's viability and technical robustness.

Pixel Hack – Artistic Image Processing

Aug 2023 - Present

Image Processing | Python, JavaScript, NumPy

- Applied color quantization techniques using k-means clustering in Python to reduce the color palette, efficiently grouping colors while preserving key visual elements and optimizing the aesthetic appeal of the artwork.
- Developed an interactive web interface using JavaScript to visualize and explore the final artistic output in real-time.
- The final results were transformed into a physical sculpture and exhibited in a public library.

PROFESSIONAL & LEADERSHIP EXPERIENCES

teksafari .ORG, Tanzania	May 2022 - Present
Co-Founder & Executive Director	Seasonal
<ul style="list-style-type: none">Co-founded TekSafari.org, delivering STEM education in electronics and programming to 5,000+ underprivileged students, promoting technical literacy in Tanzania.Led national teksafari events (hardware programming and data structures workshops, hackathons, STEM exhibitions), expanding access to hands-on tech education.Raised over \$40,000 in funding through partnerships, projects, and grants, driving organizational growth and sustainability and opening the first open access maker space in the country.	
Sears think[box] – Innovation and Makerspace	June 2024 - Present
Program Assistant Prototyping, Fabrication, Project-Management, Machine Maintenance	Part-time
<ul style="list-style-type: none">Assisted visitors in utilizing prototyping and fabrication equipment, including 3D printers, CNC machines, Water-Jet Cutters, and electronics tools, to bring their ideas to life.Managed public reservations and analyzed databases in Airtable and Trello to identify future opportunities and optimize resource allocation.Designed tailored programs for various demographics, improving user experience and expanding the makerspace’s reach within the community.Designed learning kits and programs to help beginners learn about robotics, electronics and soldering	

AWARDS & HONORS

\$2,500 grant	To build a USSD-based online payment system MVP for the underbanked Tanzanians	2024
\$10,000 Davis Peace Prize	For founding (teksafari.org) to address tech inequalities in Tanzania	2024
\$5,000 Morgenthaler-Pavey Competition,	for establishing a startup with significant social impact	2024
Davis Scholar	Full Scholarship to pursue higher education in 50+ USA institutions	2022
UWC Scholar	Full Merit Scholarship to attend high-school in Germany	2020
\$1,500 TechMaster award	for best application of technology to address environmental sustainability	2024
Electrical Engineering Award:	For creating a system that addresses local electrical energy issues	2020