

# Ignas A. Kamugisha

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## 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"><li>Co-founded TekSafari.org, delivering STEM education in electronics and programming to 5,000+ underprivileged students, promoting technical literacy in Tanzania.</li><li>Led national teksafari events (hardware programming and data structures workshops, hackathons, STEM exhibitions), expanding access to hands-on tech education.</li><li>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.</li></ul>	
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"><li>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.</li><li>Managed public reservations and analyzed databases in Airtable and Trello to identify future opportunities and optimize resource allocation.</li><li>Designed tailored programs for various demographics, improving user experience and expanding the makerspace’s reach within the community.</li><li>Designed learning kits and programs to help beginners learn about robotics, electronics and soldering</li></ul>	

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