PATRICK MULIKUZA MACHUMU

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EDUCATION

Whitman College, Walla Walla, WA   **Expected graduation year:** 2028
- **Academic Areas of Interest:** Physics 3-2, Computer Science 3-2   **GPA**: 3.9
- **Scholarships:** United World College Scholarship, International Student Scholarship
- **Clubs:** Association for Computing Machinery ACM (Board Member), Society for Advancement of Chicanos and Native Americans in Science (General Secretary)

PROJECTS

Student Data Visualizer — Whitman College Immersive Stories Lab   *WA, USA | Nov 2025 – Dec 2025*

- Researched, collected, and curated real-world CSV datasets (climate change, Mount Everest, Mount Kilimanjaro) for use in immersive data-storytelling projects.
- Developed 2D and 3D interactive data visualizations using JavaScript and Plotly.js, transforming raw datasets into clear, compelling visual narratives.
- Built web-based visualizations to explore climate trends and large-scale geographic/topographic data, with climate-change visualizations selected for future deployment in a CAVE (Cave Automatic Virtual Environment).
- Applied data-visualization best practices to improve clarity, interpretability, and engagement for research and public-facing lab demonstrations.

Undergraduate Research Assistant — AI Racial Bias in Image Captioning   *WA, USA | Sept 2025 – Present*
Supervisor: Professor Saccintha Pitigala

- Conducting an in-depth literature review of research on algorithmic bias, computer vision, and image-captioning models to build a methodological foundation for analyzing racial bias in generative AI systems.
- Learning and applying core **machine learning techniques** through Coursera courses, YouTube technical tutorials, and hands-on practice, preparing to implement evaluation pipelines for large-scale image-captioning datasets.
- Assisting in the design of an empirical study that will test AI captioning models using a diverse set of human images, collecting and organizing outputs for later analysis of bias patterns.

Whitman AI | Whitman College Hackathon   Walla Walla, WA | May 2025

- Built the front-end interface for Whitman AI using HTML, CSS, and JavaScript, creating a clean, intuitive platform modeled on Whitman's official design language; contributed to a project that earned 2nd place for usability and concept execution.
- Curated and structured hundreds of Whitman-specific data points—including academic requirements, campus resources, and dining information—to train the underlying model, enabling the chatbot to deliver accurate, context-aware responses tailored to the Whitman community.
- Collaborated in a fast-paced hackathon environment to rapidly prototype features, refine prompts, and troubleshoot model outputs, ensuring the system delivered consistent, reliable answers across diverse user queries.

GPA Visualizer | *Whitman College CS 167 Final Project*   *WA, USA | May 2025*

- Designed and implemented a Python-based GPA visualization tool that calculated term GPAs from user-entered course data and generated dynamic Matplotlib bar and pie charts to clearly compare credit distribution and performance across subjects.
- Built an interactive workflow that transformed raw user inputs into automated data processing pipelines, improving calculation accuracy and reducing manual entry errors through input validation and modular function design.
- Created an optional personalized GPA certificate using Python's turtle graphics library, integrating text rendering, coordinate-based drawing, and programmatic layout decisions to demonstrate user-centered design and visual storytelling.

RELEVANT EXPERIENCES

Board Member | Association for Computing Machinery *Whitman College | Walla Walla, WA | Sept 2025 – Present*

- Organize and lead sessions on core CS professional skills—including GitHub setup, project portfolio development, and résumé refinement—supporting dozens of students in building confidence and preparedness for internships and industry roles.
- Collaborate with a 7-member leadership team to set club priorities, design semester programming, and troubleshoot challenges; contribute ideas, feedback, and logistical planning that keep ACM events running smoothly and consistently.
- Create visually engaging marketing materials—email campaigns, Instagram posts, and campus posters using Canvas—to promote ACM activities, raising club visibility and driving strong, steady attendance across events.

Academic Tutor | UWC & Whitman Academic Resource Center *Arusha, TZ & Walla Walla, WA | Sept 2022 – Present*

- Design and deliver individualized lessons for students across a wide range of subjects—including French (all levels), Introduction to Calculus, Calculus I–III, and Computer Science 167—adapting explanations, examples, and practice activities to each student's learning style.

- Support French learners from beginner to advanced proficiency by breaking down grammar, vocabulary, and cultural concepts into clear, approachable steps; strengthen students' confidence through structured conversation practice, scaffolded writing exercises, and real-life language applications.
- Help math and CS students build strong conceptual foundations by guiding them through problem-solving strategies, visual explanations, and step-by-step walkthroughs of difficult topics, improving their accuracy and independence in coursework.
- Continue to mentor peers at the college level, providing clarity on complex assignments, preparing review materials before exams, and fostering a supportive learning environment that encourages students to ask questions and develop long-term study skills.

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