

Emmanuel Nyandu Kagarabi

Curriculum Vitae

Profile

Mathematician (Bac+5 in Mathematics), Machine Learning Engineer (MSc in Artificial Intelligence for Science), and Data Manager/Curator (Master's in Data Management and Curation). I am committed to leveraging my diverse skill set to contribute to cutting-edge projects in both professional and academic (PhD-seeking) settings, with a focus on Machine Learning, Data Management, and their intersection.

Personal Information

First Name	Emmanuel
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Education

- Sep 2025 - June 2026 **Master in Data Management and Curation**, *International School for Advanced Studies*, Trieste, Italy.
- This professional Master's program provided both the theoretical foundation and practical hands-on skills essential for managing the entire research data lifecycle effectively and responsibly. Built on FAIR(Findable, Accessible, Interoperable, Reusable) principles, with the aim of making science as reproducible as possible. The program spans the basics of BASH/Git commands, Containers, FAIRification and Management of research data, Web development (Django), Inferential Statistics, Unsupervised learning, and Applied AI, and concludes with a six-month internship.
 - **Thesis** : [Web Application for DPCfam and DPCstruct Data Exploration](#).
In this project, we are developing from scratch a [Django](#) web application facilitating the exploration of [DPCfam](#) and [DPCstruct](#) datasets, with the goal of classifying proteins at large scale.
- Jan - Nov 2024 **Master's in Mathematical Sciences with a specialisation in Artificial Intelligence for Science**, *African Institute for Mathematical Sciences (AIMS) & Stellenbosch University*, Cape Town, South Africa.
- Covered Optimisation, Bayesian modelling, Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, and related topics, at the intersection of AI and the sciences.
 - **Thesis**: [AI-Powered Classification and Early Detection of Dengue Virus Lineages for Timely Public Health Response](#):
In this study, we implemented Machine Learning techniques to classify Dengue virus genomic sequences into lineages and proposed an algorithm for the early detection of potential new variants.
- Oct 2016- Nov 2021 **Bachelor's in Mathematics (BAC+5)**, *Bukavu Teacher Training College (TTC-Bukavu)*, Bukavu, DRC.
- Including Algebra, Analysis, Topology, Geometry, Probability-Statistics, Operational Research, and more, this five-year program addressed a broad spectrum of subjects in both Pure and Applied Mathematics.
 - Theses: [Numerical Methods for Nonlinear Optimization](#) (BAC+3) and [Processing of Numerical Tensors](#)(BAC+5).
In these projects, I explored respectively the standard optimization algorithms (with and without constraints) and the mathematical foundations of tensors, which generalize matrices to higher dimensions.

Awards

- Sep 2025 – June 2026 **Area Science Park Fellowship**.
- Fully funded fellowship from [Area Science Park](#) & [SISSA](#) awarded to some selected candidates to pursue the Professional Master in Data Management and Curation ([MDMC](#)) at [SISSA](#), Italy.
- Jan – Nov 2024 **Google DeepMind Scholarship**.
- This fully funded scholarship from [Google DeepMind](#) was awarded to the top forty African students (out of over 2,000 applicants) to pursue the Master's in [Artificial Intelligence for Science](#) at [AIMS](#) South Africa.
- April 24, 2021 **Bourse d'Excellence Cimpunda (BEC)**.
- A scholarship recognising the best students(per academic year) in Bukavu City, DRC. [Certificate](#).

Internships

- Jan – June 2026 **Research Intern, LADE/Area Science Park, Trieste, Italy.**
In this project, We are designing and developing a browser-based web application from scratch using Django, enabling users to navigate the DPCfam and DPCstruct datasets related to protein clusterisation.
- August – October 2024 **Research Intern, Centre for Epidemic Response and Innovation (CERI), Cape Town, South Africa.**
 - Developed a pipeline for classifying Dengue virus genomic sequences into lineages and detecting potential new variants using machine learning, deep learning, and generative models.
 - Applied techniques like k-mer encoding, FCGR, one-hot encoding, and VAE-based synthetic data generation to enhance classification and variant detection.
 - Achieved over 97% Accuracy/F1-score and validated results against the Genome Detective Typing Tool, contributing to real-time genomic surveillance.

Work Experience

- Sep 2022 – Dec 2023 **Visiting Mathematics Tutor, Université Officielle de Bukavu (UOB-BUKAVU), Bukavu, DRC.**
 - Conducted Practical work in **Linear Algebra and Analytical Geometry** for first-year students in the Ecole des Mines faculty. Also taught **General Mathematics** (Algebra and Analysis) to first-year students in the Sciences Appliquées faculty (Geology, Biology, Environment, and Agronomy).
- April - June 2022 **Visiting Mathematics Tutor, Bukavu Teacher Training College (TTC-Bukavu), Bukavu.**
 - To third-year Chemistry-Physics students, taught **Mathematics for Chemists II**.

Volunteer Experience

- March 17 - 22, 2024 **Volunteer, African Institute for Mathematical Sciences (AIMS), Cape Town, South Africa.**
 - Celebrating AIMS's 20th anniversary, volunteered at the SIYAKHULA (Growing Mathematics in Africa) festival. [Certificate.](#)

Workshops Attended

- April 17 - 19, 2024 **Africa Scientifique Programme.**
 - A capacity-building programme for African researchers, and science communicators at AIMS South Africa. [Certificate.](#)
- June 10 - 29, 2024 **Meaningful Modeling of Epidemiological Data (MMED) 2024.**
 - An intensive introduction to data-driven infectious disease modeling, with participants coming from across Africa and around the world, held at AIMS South Africa.

Skills

- \LaTeX • Expert in typesetting complex mathematical documents, equations, and figures.
- Programming • Proficient in Python for scientific computing and Data Analysis.
- Web Dev • HTML, CSS, JavaScript and Django framework
- Teaching • Experience in Applied & Pure Mathematics instruction.
- Data Analysis • Skilled in data preprocessing, visualization, and statistical analysis.
- AI • Expertise in building, training, and optimizing neural networks with TensorFlow and PyTorch.
- Soft Skills • Communicator and problem-solver, adaptable and motivated in both independent and team-based settings.

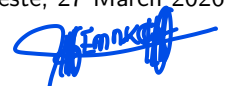
Languages

English : Proficient (CEFR B2), French : Native or bilingual proficiency, Italian : Beginner.

References

- **Dr. Valerio Pionponi**, *Technologist Researcher at the Laboratory of Data Engineering(LADE), Area Science Park*, Current Master's thesis supervisor. Email: valerio.pionponi@areasciencepark.it .
- **Dr. Elaheh Saadat**, *Researcher at the Laboratory of Data Engineering(LADE), Area Science Park*, Current Master's thesis co-supervisor. Email: elaheh.saadat@areasciencepark.it .
- **Dr. Joicymara Xavier**, *Researcher at the Centre for Epidemic Response and Innovation (CERI), Stellenbosch University*, Previous Master's thesis supervisor. Email: joicy.xavier7@gmail.com .
- **Prof. Justin Buhendwa Nyenyezi**, *Head of the Natural Sciences faculty and Lecturer in the Mathematics-Physics department at TTC-Bukavu*, Bachelor's thesis supervisor. Email : justinnyenyezi@gmail.com.

Trieste, 27 March 2026



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