Emmanuel Nyandu Kagarabi

Curriculum Vitae

Profile

I hold a Bachelor's degree in Mathematics, complemented by teaching experience, and a Master's in Artificial Intelligence for Science from AIMS South Africa & Stellenbosch University, fully funded by the prestigious Google DeepMind Scholarship. I have strong skills in Optimization, Machine Learning, Computer Vision, Reinforcement Learning, and Deep Learning, along with advanced proficiency in Python programming. I am passionate about both the theoretical foundations of Mathematics and AI and their real-world applications to solving complex challenges.

Personal Information

First Name	Emmanuel
Last Name	Nyandu Kagarabi
Gender	Male
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Education

January - November 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.
- Covering Optimization, Mathematical Problem-Solving, Machine Learning by Hand, Computer Vision, Deep Learning, Natural Language Processing, Reinforcement Learning, and applications in Climate Science, Ecology, Epidemiology, and more, this program ran at the fascinating junction of artificial intelligence and the sciences.
- Here are all of the courses, and some of my presentations can be found here.
- Thesis: AI-Powered Classification and Early Detection of Dengue Virus Lineages for Timely Public Health Response: Under the support of CERI, this study used Machine Learning and Deep Learning techniques to efficiently classify Dengue genomic sequences into lineages. With over 100 million infections reported yearly, the outcomes aimed to improve the genomic surveillance of the Dengue virus.

October 2016- November 2021

Bachelor's in Mathematics, *Institut Supérieur Pédagogique de Bukavu (ISP-BUKAVU)*, Bukavu, DRC.
- Including Algebra, Analysis, Geometry, Probability-Statistics, Operational Research, Physics, and more, this five-year program addressed a broad spectrum of subjects in both Pure and Applied Mathematics.
- Theses: *Processing of Numerical Tensors* and *Numerical Methods for Nonlinear Optimization*.
These projects introduced me to Nonlinear Optimisation and Numerical Analysis, where I implemented various optimization algorithms and studied mathematical foundations for numerical tensors.

Awards

January - November 2024

Google DeepMind Scholarship.
- This fully funded scholarship from Google DeepMind was awarded to the top forty African students to study the Artificial Intelligence for Science Masters at AIMS South Africa.

April 24, 2021

Bourse d'Excellence Cimpunda (BEC).
- A scholarship recognising the best students in Bukavu City, DRC. Certificate.

Work Experience

September 2022 - December 2023
Part-time Teaching Assistant, *Université Officielle de Bukavu (UOB-BUKAVU)*, Bukavu, DRC.
• Taught Practical work in Linear Algebra and Analytical Geometry to 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).

October 2022 - December 2023
Visiting Teaching Assistant, *Institut Supérieur d'Études Commerciales et Financières de Bukavu (ISECOF Bukavu)*, Bukavu, DRC.
• Taught General Mathematics to first-year students across various faculties (Financial Management, Business Management, Management and Administration, and Computer Science).

April - June 2022
Visiting Teaching Assistant, *Institut Supérieur Pédagogique de Bukavu (ISP-BUKAVU)*, Bukavu.
• For third-year Chemistry-Physics students, instructed Mathematics for Chemists II.

Dec 2020 - Jan 2021
Trainee, *Société Nationale d'Électricitée (SNEL)*, Bukavu.
• Gained practical knowledge of hydroelectric power plant operations, specifically at the RUZIZI 1 plant. Certificate.

Dec 2020 - Jan 2021
Trainee, *Unité de Recherche et Enseignement de Mathématiques Appliquées (UREMA)*, ISP-BUKAVU.
• Acquired insights into the functioning of a scientific research unit, focusing on Pure and Applied Mathematics.

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 • Proficient in writing complex text, equations, and drawing figures.

Coding • Proficient in Python and R.

Teaching • Experienced in teaching both Applied and Pure Mathematics.

Artificial Intelligence • Expertise in building and training Artificial Neural Networks in various AI sub-fields, with or without any fancy library, depending on the problem.

Languages

French • **Fluent**

English • **Proficient (CEFR B2)**

Kiswahili • **Native Speaker**

References

- **Dr. Joicymara Xavier**, *Researcher at the Centre for Epidemic Response and Innovation (CERI), Stellenbosch University*, Master's thesis supervisor. Email: joicy.xavier7@gmail.com .

- **Prof. Dr. Justin Buhendwa Nyenyezi**, *Head of the Sciences Exactes Section and Lecturer in the Mathematics-Physics Department at ISP-Bukavu*, Bachelor's thesis supervisor.
  Contacts: +243 975 589 099 / +243 851 216 456, justinnyenyezi@gmail.com

- **Dr. Sylvestre-Alvise Rebuffi**, *Senior Research Scientist at Google DeepMind*, Mentor throughout my MSc program. Email: sylvestre@meta.com.

- **Dr. Claire David**, *Academic Director of the AI for Science Master's programme at AIMS South Africa*. Email: claired@aims.ac.za

- **Prof. Dr. Simon Muya Kasanda**, *Director of the École des Mines Faculty and Lecturer at UOB-Bukavu*, Contacts: +243 825 595 081, simon.muya.kasanda@gmail.com.

Bukavu, 31 January 2025
Emmanuel Nyandu Kagarabi