Jean Lucien Randrianantenaina

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Jean Lucien RANDRIANANTENAINA
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Education

MSc. in Machine Learning and Artificial Intelligence — **Jan. 2024 – Dec. 2024**
Stellenbosch University, South Africa

MSc. in Mathematics and Applications – Fundamental Mathematics — **Jun. 2019 – Jan. 2024**
Faculty of Science, University of Fianarantsoa, Madagascar — Grade: 14.25/20

MSc. in Mathematical Sciences – Fundamental Sciences — **Sep. 2022 – Jun. 2023**
African Institute for Mathematical Science (AIMS), Limbé Cameroon — Grade: 3.52/4

BSc. in Mathematics and Applications – Fundamental Mathematics — **Nov. 2015 – Apr. 2019**
Faculty of Science, University of Fianarantsoa, Madagascar — Grade: 14.69/20

Research Experience

Conditional Flow Matching in Feature Space (Msc. Thesis) — **Ongoing**
Study the relationship between the dimensions of the latent space, the loss function used to train the auto-encoder, and the quality of the generated images from a conditional flow matching model trained on the feature of an encoder.

Movie Recommender System — **Feb. 2024**
Large-scale recommender system, using probabilistic matrix factorization and trained on the 25M MovieLens dataset. Implemented from scratch using Python, Numba and Numpy.

Optimizing U-net architecture for brain tumour segmentation, using Genetic Algorithm (MSc. Thesis) — **2024**
Proposed and implemented a genetic algorithm approach to obtain an optimal U-net architecture, enhancing brain tumour segmentation accuracy while minimizing the number of parameters.

Carmichael Number (MSc. Thesis) — **2023**
Explored the properties of Carmichael Numbers and proved the non-existence of Carmichael Numbers in the form of $2^n p^2 + 1$, where p is a prime number. The result is published in the INTEGER Journal

Radical resolution of a polynomial Equation (BSc. Project) — **2019**
Exploration of the radical resolution method and an explain why there is no general formula to solve polynomial equations of degree higher than five.

Publication and Talks

Florian Luca and Jean Lucien Randrianantenaina,"There Is No Carmichael Number of the Form $2^n p^2 + 1$ with p prime", INTEGER, Volume 23 (2023).

Talk at AIMS Cameroon, 2023: "Fermat last theorem, with n=4".
Presented to AIMS Cameroon students.

Certification

Business Management — **Jully 2023**
ESMT Berlin, II Africa, IIP – Limbé, Cameroon
One-month of intensive course and practice, focused on business management principles and development of essential soft skills.

Back-end developer — **Jan. – Aug. 2022**
SAYNA & OIF: DCLIC Program 1.0 – Fianarantsoa, Madagascar
A comprehensive six-month training program for website development, covering key technologies including HTML5, CSS3, JavaScript, Node.js, and MySQL.

Prizes/Awards/Scholarships

Google DeepMind Scholarship: Fully funded Master's Program, Stellenbosch University, South Africa — **2024**

Industry Immersion Program (IIP) Scholarship: awarded by AIMS, II Africa, and ESMT Berlin, Germany. — **2023**

MasterCard Foundation Scholarship: Fully funded Master's Program at AIMS Cameroon — **2022**

SAYNA and the Organisation Internationale de la Francophonie (OIF): Fully funded D-CLIC 1.0 Programs (2022). — **2022**

Skills

Programming

- Python
- JavaScript
- HTML/CSS/SASS
- LaTeX

Library/Framework/Versioning

PyTorch, TensorFlow, JaX, Pandas, Scikit-Learn, Django, Flask, NodeJs, Bootstrap, Sympy, Git

Language

- English
- French
- Malagasy

Personnal Project

Neural Machine Translation — Jul. 2024
Developed a neural machine translation model and fine-tuned the opus-mt-en-af model to translate engineering assessments from English to Afrikaans.

Trigram Language Model and BPE — Jun. 2024
Implemented a trigram language model for language identification and used Byte-Pair Encoding (BPE) for language similarity analysis.

MK-Forum — 2023
Created a web forum dedicated to mathematics. Developed the front end using HTML, CSS/Bootstrap, and JavaScript, while the back end utilizes Python/Django and MySQL. The forum includes features such as user accounts, posts, comments, and a voting system.

Unbeatable TicTacToe — 2022
Implemented with HTML, CSS, and JavaScript. Used the minimax algorithm and its combination with random moves to create three levels of difficulty.

Pendu Malagasy — 2022
Created a hangman game using Tkinter and Python. The default word list is in Malagasy, which can be easily changed to another language.

Bellman Kalaba GUI — 2021
Developed a graphical user interface (GUI) for graph representation and shortest-path finding using the Bellman-Kalaba algorithm with Tkinter and Python.

References

Available upon request