

Clément ADANDE

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Profile

With a background in numerical analysis and currently completing a Master's degree in Artificial Intelligence (AI) for Science, I am seeking to apply and deepen my expertise in natural language processing, healthcare, disease modelling and numerical analysis.

Education

- Jan - Nov 2024 **Stellenbosch University, African Institute for Mathematical Sciences, South Africa,**
Masters program - AI for Science (Fully-funded by **Google DeepMind**) [link](#)
Relevant courses: Meaningful Modelling of Epidemiological Data, Bayesian Modelling and Probabilistic Programming with Examples from Epidemiology, Deep Learning, Theoretical Foundation of ML, Optimisation, Natural Language Processing, Computer Vision, Google Cloud Computing.
- Oct 2020 - Oct 2022 **University of Abomey-Calavi, Institute of Mathematics and Physic Sciences, Benin,**
Masters in Fundamental Mathematics
Relevant courses: Evolution Equation, Numerical Methods for PDEs, Elliptic-Type PDEs, Control Theory, Convex Analysis and Optimization, Probability Theory, Numerical Analysis, Functional Analysis.
Specialization: Numerical Analysis.
- 2016-2019 **University of Abomey-Calavi, Faculty of Sciences and Technologies (FAST), Benin,**
Bachelors in Fundamental Mathematics
Relevant courses: Linear Algebra, Statistical Methods for Data Analysis, C++ Language, Stochastic Modeling with R, Graph Theory, Differential Equations and Dynamic Systems, Probability and Statistics, Partial Differential Equations.

Research Projects

Jul - Oct 2024 **AI for Science Research Project**

Title: Multilingual Backpack Language Models, [link](#)

- Determine the effectiveness of Backpack Language Models (LMs) a multi-lingual context
- Assess models' performance via perplexity, cloze task and lexical relationship task
- Train a customized BPE tokenizer on Europarl and MultiUN corpora
- Use of Colab and Kaggle to create, run and present interactive Python codes
- Write Pytorch scripts to train Backpack and GPT2 LLMs.
- Integrate GPU compatibility into PyTorch scripts
- Create Virtual Machine on Google Cloud Platform for Colab and also general purpose.
- Use Cloud Shell to run Python scripts and Managed multiple terminal sessions one Cloud Shell window using the package `screen`.
- Report my achievement in an essay.

Supervisor: Asst. Prof. Francois Meyer, *University of Cape-Town*

Aug - Oct 2022 **Numerical Analysis Master's Thesis**

Title: Non-conforming Finite Element Approximation for Some Evolution Problems and A-Posteriori Error Analysis

- Approximate the solution of heat equation and Stokes using the Backward Euler scheme in time and Crouzeix-Raviart finite elements in space.
- Bound and control the approximation error analysis by quantities independent to the exact solution named error estimators.
- Perform numerical test using Octave/Matlab to confirm the theoretical result.

Supervisor: Prof. Guy Degla, *Institut de Mathématiques et de Sciences Physiques*

Co-supervisor: Asst. Prof. Wilfrid Houedanou, *Faculté des Sciences et Techniques (UAC)*

Course projects

- Jul 2024 **Modeling the transmission dynamics of influenza in a population subdivided into two groups using SEIRV models.**
During the **MMED 2024 Workshop** at AIMS
- May 2024 **Recommender systems based on collaboration filtering using Numpy**
Course project led by Prof. Ulrich Paquet, Director of AIMS South-Africa
- Apr 2024 **Fine-tuning the BLOOM-250M, a Hugging Face's LLM for question-answering task**
Course project led by Profs. Jan Buys and François Meyer, Assistant Professors at University of Cape-Town
- Feb 2024 **Bird sound classification using CNN and Transfert learning with TensorFlow**
Course project led by Emmanuel Dufourq, head of Ecology Research Group at AIMS South Africa

Online Courses and Certifications

- Nov 2024 **Kaggle, 5-Day Gen AI Intensive Course with Google**, [link](#)
- Aug 2024 **NVIDIA Deep Learning Institute, Building Transformer-Based NLP Application**, [link](#)
- Jun 2024 **OpenAI, ChatGPT Prompt Engineering for Developers**, [link](#)
- May 2024 **LangChain/Tavily, AI Agents in LangGraph**, [link](#)
- Feb 2023 **Université de la Réunion, Mastering the bash shell**, [link](#)
- Jul 2022 **Stanford University, Machine learning**, [link](#)
- Jan 2021 **University of York, An Introduction to Deep Learning and Autonomous Systems**, [link](#)

Experience

- 2016-2023 **Private Mathematics Tutors, Employed by parents of students**
 - Assisted high school students to improve the level mathematics
 - Provided customised methods to enhance the students' problem solving skills
- 2020-2022 **Editorial of the writing of the book "Les Annales de l'APMB, Série D, édition 2022", Association of Mathematics Teachers of Benin (APMB)**
 - Typed content of the book using \LaTeX
 - Collecting the contributions of different participants
 - Organising the structure and layout of the book
- 2019-2020 **Mathematical course material for junior high school class**, [link](#)
 - Wrote course material for the mathematical curriculum in Benin.
 - The course is designed for high school students in scientific stream.

Skills

Programming	Python	■ ■ ■ ■ ■
	Bash	■ ■ ■ ■ ■
	C++	■ ■ ■ ■ ■
ML Libraries	Pytorch	■ ■ ■ ■ ■
	TensorFlow	■ ■ ■ ■ ■
Cloud Service	Google Cloud Platform	■ ■ ■ ■ ■
Version Control	Git	■ ■ ■ ■ ■
Others	Google Colab & Kaggle	■ ■ ■ ■ ■
	Rstudio	■ ■ ■ ■ ■
	LaTeX	■ ■ ■ ■ ■

Language Information

English	Upper-Intermediate (current language of study)	<i>Reading, writing, and speaking</i>
French	Advanced (Native)	<i>Reading, writing, and speaking</i>

Honors and Awards

- 2024 **Google DeepMind Scholarship**
Awarded for academic achievement in Artificial Intelligence and Machine Learning.
- 2022–2024 **CEA-SMA Scholarship**
Awarded for academic excellence in Mathematics and its applications.
- Oct 2023 **3rd Place, Fiscathon**
○ Hackathon organised by the Direction Générale des Impôts (Benin).
○ Secured 3rd place for developing innovative solutions to tax-related challenges.
- 2017–2019 **DBSU Scholarship**
Awarded for academic excellence in Mathematics and its applications.

Volunteer Experience

- March 2024 **Volunteer, Siyakhula Festival, African Institute for Mathematical Sciences (AIMS)**
Assisted with the logistic Event organised by AIMS for its 20th anniversary.
- July 21st, 2021 **Teaching introduction to \LaTeX , Institute of Mathematics and Physic Sciences (IMSP)** [link](#)
○ Assisted students to install MikTeX.
○ Introduced students to the basic concepts of \LaTeX .
○ Guided students in writing their first document using \LaTeX .