

Clément ADANDE

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Profile

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

Education

- Jan - Oct 2024 **Stellenbosch University, African Institute for Mathematical Sciences, South Africa**, Masters program - AI for Science (Fully-funded by **Google DeepMind**) [link](#)
Relevant courses: Deep Learning, Theoretical Foundation of ML, Optimisation, Bayesian Modelling and Probabilistic Programming with Examples from Epidemiology, Natural Language Processing, Computer Vision, Google Cloud Computing, Meaningful Modelling of Epidemiological Data.
- Oct 2022 - Jul 2023 **University of Abomey-Calavi, Institute of Mathematics and Physic Sciences, Benin**, First year of Phd in Numerical Analysis.
- 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, Convex Analysis and Optimization, Advanced Topology and Introduction to Functional Spaces, Probability Theory, Numerical Analysis, Functional Analysis, Hilbertian Analysis, Control Theory.
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 Dynamical Systems, Probability and Statistics, Partial Differential Equations.

Research Projects

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

Title: Backpack Language Models for Multi-Sense Settings

- Determine the effectiveness of Backpack Language Models (LMs) a multi-lingual context
- Assess models' performance via perplexity, cloze task and lexical relationship task
- Build a customized BPE tokenizer for Europarl and MultiUN corpora
- Use on Colab and Kaggle to create, run and present interactive Python codes
- Write Pytorch scripts to train Backpack and GPT2 LLMs.
- Integrate GPU compatibility into a PyTorch script
- 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 (**on going**).

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

Aug 2024 **NVIDIA Deep Learning Institute**, *Building Transformer-Based NLP Application*, [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	■ ■ ■ ■ ■
	LaTeX	■ ■ ■ ■ ■

Language Information

English	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.
- 2022–2023 **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 .