

Joseph Domguia

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Engineer dedicated to machine learning and artificial intelligence, striving to enhance systems capable of advanced reasoning.

Summary of Qualifications

- Extensive research experience spanning NeuroImaging, NLP, and dialogue systems.
- Backed by a strong foundation in computer science, math and machine learning and deep learning.
- Proficient in Python, Java, and various programming languages, leveraging libraries such as PyTorch, TensorFlow, and scikit-learn.
- Entrepreneurial mindset evidenced by successful ventures in music industry and digitalization solutions.
- Cross-disciplinary insights, blending expertise from machine learning neuroscience to push the boundaries of AI.
- Fusion of cross-disciplinary insights, amalgamating machine learning, neuroscience, and computational reasoning.
- Proficiency in cloud platforms (AWS, GCP), databases (SQL, NoSQL), and cutting-edge technologies (DevOps, Docker, Git).

Education

2019 – 2021 **Master in Machine Intelligence**, *African Institute for Mathematical Science Kigali, Rwanda*

Google & Meta scholarship (70 out of 7,000 applicants) and 2nd of the Cohort

Thought by top AI reserachers from Google, Facebook, Deepmind, NYU and more

Relevant Coursework: Mathematics of Machine Learning, Foundations of Machine Learning, Bayesian Inference in ML, Deep Learning, Natural Language Processing, Machine Learning with Kernel Methods, Probabilistic Graphical Models, Reinforcement Learning, Optimization for Machine Learning, Computer Vision, Speech Recognition, Geometric Deep Learning.

Thesis: Text Visual Question Answering on Text-VQA with Transformers

2017 – 2019 **Master in Computer Engineering**, *Polytechnique Yaounde, Cameroon*

Recipient of Government Scholarship (300 out of 30,000 applicants)

Relevant Coursework: Linear Algebra, Functional Analysis, Statistics & Probability, Data Structures & Algorithms, Software Design.

Thesis: Prediction Assistant for Bus Drivers

Work Experience

Oct.2023 **Research Engineer Intern**, *MIP:Lab*, EPFL, Switzerland

July.2023 ○ Played a key role in the development and refinement on NeuroImaging Graph Signal Processing tools box (NiGSP)

July.2023 **Consultant**, *Genu*, Cameroon

- May.2022 ○ Extend the client pool to the international market ei. North America
○ Worked on billing and payment software for the most active port of Cameroon
○ Built Large Language Models (LLM) base solutions such as Information Retrieval and in-context reasoning

July.2023 **Teaching Assistant**, *African Institute of Mathematical Science*, Rwanda

- April.2023 ○ Assisted Master Students, the best accross all Africa on their final machine learning research projects
○ Recipient of the Tutor Awards 2023

Aug.2022 **Teaching Assistant**, *Neuromatch Academy*, USA remote

- July.2022 ○ Led students on machine learning fundamentals and reinforcement learning
○ Tutored a wide range of concepts: mathematics, statistics, programming, and neuroscience

May.2022 **AI Fellow**, *Pi-School*, Italy, remote

- March.2022 ○ Developed language Variant detection and Sub-word level language classification
○ Provided insight to the company, on the biased of their data

May.2022 **Business Intelligence Consultant**, *Aptude*, USA remote

- Feb.2021 ○ Integrate diverse sources of data and build visualization, for a data warehouse for the Rwandan Government
○ Worked with various technologies such as ETL, Elastic Search, Logstash, Kibana, Ruby, CI/CD, Gitlab

Nov.2021 **Research Engineer Fellow**, *Ishango.ai / Omniscient Neurotechnology*, Australia remote

- Sept.2021 ○ Achieved 83% accuracy in predicting schizophrenia using fMRI brain scans and connectomics
○ Further analysis of demographics led to identify contribution of aging in Schizophrenia.

Feb.2021 **Founder**, *Genu*, Cameroon

- Feb.2019 ○ Built custom software for businesses's digitalization, data analysis, and machine learning needs
○ Built a compliance software processing thousands transactions daily for Banks in the CEMAC economic area

Nov.2018 **Lead Engineer**, *Traveler*, Cameroon

- Led the development of fleet management software which led to a 50x increase company's market.

- March.2018 **Machine Learning Engineer**, *Traveler*, Cameroon
- April.2017
 - Developed driver assistant that did improve the safety of highway driving using bus tracking record.
 - We build that with XGBoost, Tensorflow, Python, R, Matplotlib, Google App Engine, Spark, Mesos, Firebase, GCP
- March.2013 **Software Engineer**, *Human Wireless*, Cameroon
- Feb.2014
 - Built a innovative ChatBot Assistant in a low connectivity environment.
 - Right after launch it become the most popular consumer product of the company.
 - Worked on a live and end-to-end encrypted messaging system.
- Oct.2019 **Co-Founder**, *VRJmusic*, Cameroon
- July.2012
 - Wrote the first code and led the team of our music sharing and streaming platform.
 - Our team built the most popular music platform in Central Africa at the time.

Publications

- 2023 **Whispering Across the Continent: Collecting and Analyzing African Culture Using Community Radios**, J. Domguia, A. Nkama, Black in AI NeurIPS and Tiny Paper ICLR, *work on progress*
- 2022 **Text Visual Question Answering on Text-VQA with Transformers**, E. Oduntan, J. Domguia, Deep Learning Indaba
- 2020 **Towards end-to-end training of proposal-based 3D human pose estimation**, D. Ajisafe, J. Domguia, et al., DiffCVGP

Open Source Projects

- 2023 **Contributed to NiGSP**: A python library and toolbox for running Graph Signal Processing on multimodal MRI data (project repo)
- 2022 **Graph Neural Network with Perceiver model**: Used a large context perceiver transformer model to address smoothing issues of graph neural networks observed on very large graphs (ongoing project repo)
- 2020 **DNA Sequence bonding prediction with Kernel**: Implemented a mismatch kernel achieving 72% accuracy, the highest score in the DNA binding site prediction competition (project repo)
- 2020 **Object detection, segmentation, and tracking**: Developed an object tracking method with Detectron based on IoU, achieving 85% tracking accuracy in testing on cars (project repo)

Technical Skills

Machine Learning: PyTorch, TensorFlow, Jax, Numpy, OpenCV, SciKit, Prompt engineering :-)
Coding: Python, Matlab, C++, JavaScript, Java, R, Rust, Ruby
DevOps: Linux, Cloud, Docker, Git, AWS, GCP
Databases: SQL, Elastic Search, MongoDB

Leadership/Volunteer

Program Manager at Xpand Foundation: Support talent in developing their potential
Team Leader: On charge of the Cameroon's Team at the International Mathematics Olympiad (IMO)
Co-Founder of VRJmusic: First music-sharing platform in Central Africa in the 2010s

Soft Skills

Insatiable Curiosity, Empathic, Entrepreneurship, Problem solver & Good debugger

Languages

English: Fluent
French: Native