NDEYE MAGUETTE MBAYE - PhD

AI Research Engineer | Foundation Models – Multimodal AI

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Portfolio | Github | LinkedIn

About Me

PhD in Artificial Intelligence, specialized in multimodal and transformer-based models. I have a strong interest in fundamental AI research, generalization and evaluation of deep learning models. I also care deeply about responsible and scalable AI systems, with a solid background in communication and cross-functional collaboration.

Selected Work Experiences

AI Research Scientist - Machine Learning & Multimodal Modeling **September 2019 - September 2024 | 5 years**

Center for Computation Biology | Institut Curie, Mines Paris PSL and INSERM | Paris, France.

- Developed classical ML models and Transformer-based models (pretraining and fine-tuning) for multimodal data (text + tabular + sequential)
- Designed late fusion Transformer architectures (based on BEHRT), improving predictive performance (AUC +10%)
- Ran comparative experiments across 3 embedding strategies (Time embeddings using time2vec, Numerical value embeddings for continuous features, contextual embeddings), improving AUC from 0.68 to 0.75 on downstream prediction tasks
- Analyzed model behavior and interpretability to support real-world use
- Collaborated with domain experts (researchers, clinicians, engineers) to interpret results and validate findings
- Co-authored a paper, presented results in 5+ international conferences

Research Scientist intern **November 2022 - January 2023 | 3 months**

Max Planck Institute for Psychiatry | Munich, Germany

- Developed Tansformer-based models for multimodal EHR using multiple integration methods
- Benchmarked 4+ embedding strategies for patient trajectory modeling, improving prediction performance by ≈ 7%

Research Scientist intern **June - September 2021 | 3 months**

IBM Research Lab | Haifa, Israel

- Data mining large scale datasets (MIMIC II databases, Institut Curie's datasets)
- Explored Tansformer-based models for tabular datasets based on the BEHRT model

Education

Ph.D. in Bioinformatics, *Mines Paris PSL, France* 2019 – 2024
Focus on Deep Learning – Multimodal AI and Foundation models

Master in Biomathematics – Bioinformatics, *Cheikh Anta DIOP University of Dakar, Senegal* 2016 – 2019

Technical Skills

AI & ML Expertise	Foundation Models (pretraining, representation learning, fine-tuning, prompting, evaluation etc.) Multimodal ML (text, structured, temporal data) Retrieval-Augmented Generation, Model interpretability (XAI) Evaluation frameworks
AI Tools	ML & DL libraries (numpy, pandas, scikit-learn, Pytorch, Pytorch Lightning), Generative/Agentic AI frameworks (Huggingface, Transformers, spaCy, BeautifulSoup, NLTK, Langchain, Langgraph etc.), Data visualization (matplotlib, seaborn, ggplot2), MLOps (Weights & Biases, Git), XAI (Shap, LIME, Captum), APIs & Prototyping (Streamlit, FastAPI), Accelerated computing (CUDA, SLURM).
Programming Languages	Python, R, Bash.

Professional Skills

Communication	Lead writer of scientific articles Speaker in international conferences (Basel, Paris, Munich, Jerusalem) Lead author of AI findings reports to cross-functional teams
Project management	Owner of end-to-end AI research projects: from dataset curation to model training and evaluation Managed technical scope, timelines, and collaborations
Research culture	Proactive learner, adaptability to new challenges and environments, problem-solving mindset, autonomy
Languages	French : Bilingual English : Advanced

Scientific Publication

Mbaye NM et al., Multimodal BEHRT: transformers for multimodal electronic health records to predict breast cancer prognosis. (Frontiers in Oncology, 2025)