Jean de Dieu Nyandwi

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Pittsburgh, PA

Research Interests

Multimodal AI · Vision-Language Models · Evaluation/Benchmarking · Post-training · Multilingual NLP · Data Curation and Efficiency

Education

Carnegie Mellon University Aug 2022 – May 2024
Master of Science in Engineering Artificial Intelligence; GPA: 3.82/4.00

- **Graduate Coursework:** Multimodal Machine Learning (11777), Introduction to Deep Learning (11785), Introduction to Machine Learning for Engineers (18661), Trustworthy AI (24784)
- **Additional Coursework:** Applied Stochastic Processes, AI System Design, Research Methods in Engineering

University of Rwanda Sep 2017 – Jan 2022
Bachelor of Science in Electronics and Telecommunication Engineering

- Prior to joining college, graduated with distinction (top grade nationally in Electronics and Telecommunication, 2016) in senior high-school advanced-level national exam.

Publications

CulturalGround: Grounding Multilingual Multimodal LLMs With Cultural Knowledge
Jean de Dieu Nyandwi, Yueqi Song, Simran Khanuja, Graham Neubig
EMNLP 2025 (Main Conference)
arXiv
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NaturalBench: Evaluating Vision-Language Models on Natural Adversarial Samples
Baiqi Li*, Zhiqiu Lin*, Wenxuan Peng*, **Jean de Dieu Nyandwi***, Daniel Jiang, Zixian Ma, Simran Khanuja, Ranjay Krishna, Graham Neubig, Deva Ramanan (*equal contribution)
NeurIPS 2024
arXiv
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Pangea: A Fully Open Multilingual Multimodal LLM for 39 Languages
Xiang Yue*, Yueqi Song*, Akari Asai, Seungone Kim, **Jean de Dieu Nyandwi**, Simran Khanuja, Anjali Kantharuban, Lintang Sutawika, Sathyanarayanan Ramamoorthy, Graham Neubig (*equal contribution)
ICLR 2025
arXiv
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Research Experience

Visiting Researcher Dec 2024 – Present
Language Technology Institute, Carnegie Mellon University *Pittsburgh, PA*

Advisor: Prof. Graham Neubig

- Developing culturally-aware Multimodal Large Language Models (MLLMs) with focus on underrepresented languages
- Investigating evaluation and post-training methodologies for Vision-Language Models (VLMs)

Graduate Student Researcher Sep 2023 – Dec 2024
Language Technology Institute, Carnegie Mellon University

Advisor: Prof. Graham Neubig

- Developed unified evaluation framework for 35+ MLLMs, used in NaturalBench (NeurIPS 2024)

- Contributed to the development and evaluation of Pangea Multimodal LLM(ICLR 2025)

Founder & Scientific Author Jul 2023 – Present
Deep Learning Revision
- Founded research publishing platform for in-depth AI technical articles (https://deeprevision.github.io)
- Published comprehensive technical guides including "The Transformer Blueprint" (20K+ views)
- Cover cutting-edge topics in multimodal ML, robotic learning, and neural architectures

Selected Projects

Complete Machine Learning Package | *4,900+ GitHub* ★ | GitHub | Website
- Designed a practical machine learning curriculum that contains over 32 end-to-end notebooks covering Python programming, data analysis and visualization, data cleaning, classical machine learning algorithms, foundations of machine learning and deep learning, computer vision, and natural language processing
- Built with Python, TensorFlow, Keras, Scikit-Learn, NumPy, Pandas, Matplotlib, and Seaborn. It also contains real-world projects on real-world datasets
- Widely adopted educational resource for ML practitioners globally. The package has gathered over 4900 stars on GitHub and has helped many people to practice various machine learning concepts and techniques.
- Designing Complete Machine Learning repository deeply enhanced my understanding of different machine learning models.

Understanding Compositionality in Vision-Language Models | Report
- Worked on compositionality in visual language models(VLM) and improved the performance of popular VLMs by using synthetic dataset of hard-negatives that was used to study the cross-modal interactions in VLMs.
- Designed and implemented scalable pipeline for synthetic vision-language dataset generation using diffusion models

ModernConvNets | *340+ GitHub* ★ | *Implementation of 12+ SOTA CNN Architectures* | GitHub
- Comprehensive study and implementation of modern CNN architectures from AlexNet to ConvNeXt
- Detailed analysis of design principles, architectural innovations, and performance trade-offs
- The goal of the project was to deeply understand how those networks work, the design principles that led to their performance, and the factors that guide the choice of architectures in real-world image recognition tasks

Deep Learning for Computer Vision | GitHub
- Designed a comprehensive repository comprising technical topics and projects around several topics in deep learning and computer vision.
- The repository covers foundations of computer vision and deep learning, state-of-the-arts visual architectures in visual recognition such as Convolutional Networks and Vision Transformers, various Computer Vision tasks such as image classification, object detection and segmentation, tips and tricks for training and analyzing visual recognition systems.
- The goal of the project was to study computer vision foundations, how computer vision models are trained, and recent advances in the field.

Teaching Experience

- **Teaching Assistant**, Introduction to Machine Learning for Engineers (18661), CMU, Spring 2024
- **Teaching Assistant**, Introduction to Deep Learning (11785), CMU, Fall 2023
- **Instructor**, Introduction to Deep Learning, Mbaza NLP, 2022
- **Lead Instructor**, Deep Learning Bootcamp, The Python Academy, 2021

Professional Experience

Data Scientist Jan 2021 – Feb 2022
VIEBEG Technologies Ltd *Kigali, Rwanda*
- Analyzed sales data to optimize inventory management, achieving 20%+ revenue increase
- Developed real-time analytical dashboards for data-driven strategic decision making

Technical Skills

Languages: Python, MATLAB, Bash, LaTeX
ML/DL Frameworks: PyTorch, TensorFlow, Hugging Face Transformers, Detectron2
Tools & Libraries: Git, Weights & Biases, NumPy, Pandas, Scikit-learn, Matplotlib
Research Areas: Multimodal ML, Vision and Language, Evaluation/Benchmarking, Data Curation and Efficiency, Post-training

Service & Leadership

- **Conference Reviewer:** ICLR 2023, 2024 (Tiny Papers Track)
- **Conference Organizer:** IndabaX Rwanda 2023, 2024
- **President**, Data Science Club, Carnegie Mellon University, 2022-2023
- **Program Associate**, African Students' Education Fund(ASEF), 2017-2021

Selected Honors & Awards

- DeepLearning.AI Ambassador Spotlight, 2022
- Top 50 AI Influencers, Onalytica, 2022
- African Students' Education Fund (ASEF) Scholar, 2014-2016
- National Top Grade, Electronics & Telecommunication in senior high-school, Rwanda, 2016

Certifications

Deep Learning Specialization (DeepLearning.AI) · Machine Learning (Stanford Online)