

Toluwani Samuel Aremu

AI Researcher | Applied Scientist

[Google Scholar](#) • [Website](#) • [Medium](#) • [Email](#) • [LinkedIn](#) • [GitHub](#) • [Certifications](#)

KEY COMPETENCIES

- **Skills:** Research, Mathematics, Statistics, Machine Learning, Deep Learning, Data Science, Project Management, Programming, Writing.
- **Tools:**
 - Programming Languages: Python, VB.Net, etc.
 - Deep Learning Libraries: PyTorch, Lightning, TensorFlow, Keras, Jax.
 - Data Science Libraries: Scikit-learn, NumPy, Matplotlib, etc.
 - IDE: Visual Studio, Visual Studio Code, PyCharm, Jupyter, etc.
 - Analysis, Writing, and Presentation: Latex, Office 365, Google [Docs, Sheets, Slides].
- **Research Interests:**
 - High-Level Interests: Cognitive Science, Visual Perception, Neural Networks, Trustworthy AI
 - Low-Level Interests: Robustness, Reliability, Explainability.
 - Other Interests: Privacy, Fairness, Generative AI, Vision-Language Models (VLMs).

EDUCATION

- **Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), UAE** AUG 2023 – PRESENT
 - Doctor of Philosophy (PhD) in Machine Learning.
 - Courses: Advanced Probability and Statistical Inference, Representation Learning, Advanced Optimization Techniques, Vision-Language Models, Robustness in Computer Vision, etc.
- **Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), UAE** JAN 2021 – DEC 2022
 - Master of Science (MSc) in Machine Learning.
 - Courses: Mathematical Foundations of AI, Neural Networks, Probability and Statistical Inference, AI Applications in Smart Cities, etc.
- **University of Ibadan (UI), Nigeria** MAY 2018 – MAY 2020
 - Master of Science (MSc) in Computer Science.
 - Courses: Cryptography and Network Security, Data Structures and Algorithms, Human Computer Interaction, Advanced Programming Techniques, etc.
- **Adeleke University, Nigeria** OCT 2012 – JUL 2016
 - Bachelor of Science (BSc) in Computer Science.
 - Courses: Object-Oriented Programming, Operations Research, Numerical Analysis, Computer Logic, Finite Automata, Digital Systems, Philosophy and Logic, Philosophy of Science, Psychology, etc.

RESEARCH EXPERIENCE

- **Doctoral Student, MBZUAI, UAE** AUG 2023 – PRESENT
 - Currently working on Adversarial defense in VLMs.
 - Research Areas: Trustworthy AI.
- **Research Assistant, MCR Lab (Metaverse Center, MBZUAI), UAE** FEB 2023 – AUG 2023
 - Research projects: Video Action Recognition, AI for Optimized Scholarly Search, Responsible LLM for Mental Health and Climate Change.

- **Applied Science Intern, G42 (HealthCare), UAE** FEB 2023 – APR 2023
 - Streamlined the preprocessing of the [US CDC NHANES](#) dataset by building an end-to-end pipeline for downloading, retrieving, analyzing, and modeling.
 - Ensured that the pipeline generates a comprehensive [TRIPOD](#) report after use.
- **Graduate Research Assistant, SPriNT-AI Lab (MBZUAI), UAE** JAN 2021 – DEC 2022
 - Developed [PolyKervNets](#) to minimize reliance on ReLU activations and optimize latency in AI models during private inference.
 - Projects: Self-Supervised Racial Bias Mitigation in Face Recognition Systems, Accented Speech Recognition using Vector-Quantized Variational AutoEncoders (VQ-VAE), Gender Bias Mitigation in Word Embeddings.

TEACHING EXPERIENCE

- **Teaching Assistant, Introduction to Object Oriented Programming, UNIBADAN** 2019

VOLUNTEERING EXPERIENCE

- Graduate School Application Mentorship 2021 – PRESENT
- Associate Editor, MBZUAI Blog 2024 – PRESENT
- Peer Reviewer
 - IEEE Access 2023 – PRESENT
 - Open Information Science 2023 – PRESENT

SELECTED PUBLICATIONS

- **Conferences**
 - N. Tastan*, S. Fares*, **T. Aremu***, S. Horvath, and K. Nandakumar, "Redefining Contributions: Shapley-Driven Federated Learning," 33rd International Joint Conference on Artificial Intelligence (IJCAI), Jeju, Korea, 2024.
 - **T. Aremu*** and K. Nandakumar, "PolyKervNets: Activation-free Neural Networks For Efficient Private Inference," *2023 IEEE Conference on Secure and Trustworthy Machine Learning (SaTML)*, Raleigh, NC, USA, 2023, pp. 593-604, doi: 10.1109/SaTML54575.2023.00045.
 - W. Y. Kang*, **T. Aremu***, Y. Balah, M. Nadeem, I. G. Navarette and A. E. Saddik, "ScholarFace: Scanning Faces, Discovering Minds," 2024 IEEE International Conference on Consumer Electronics (ICCE), Las Vegas, NV, USA, 2024, pp. 1-5, doi: 10.1109/ICCE59016.2024.10444350. [Patent Application Submitted]
- **Preprints**
 - **T. Aremu**, "Regularized PolyKervNets: Optimizing Expressiveness and Efficiency for Private Inference in Deep Neural Networks," ePrint IACR, 2023. <https://eprint.iacr.org/2023/1917> (accessed Dec. 15, 2023).
 - **T. Aremu** et al., "On the Reliability of Large Language Models to Misinformed and Demographically-Informed Prompts," Jan. 2024, doi: <https://doi.org/10.2139/ssrn.4699451>.
- **Blog**
 - **T. Aremu**, "Accented Speech Recognition: The Inclusive Realm of Automatic Speech Recognition Systems," Medium, Jul. 03, 2023. <https://shorturl.at/oKLP8> (accessed Apr. 27, 2024).

- **T. Aremu**, "AI Text Detectors: Amazing Sleuths or WHAT?," Medium, Jun. 11, 2023. <https://medium.com/towards-artificial-intelligence/ai-text-detectors-amazing-sleuths-or-what-31e4e2ca7803> (accessed Apr. 27, 2024).

TALKS & TUTORIALS

- Ethical Perspectives of Artificial Intelligence, Department of Material Sciences, University of Denver, Virtual. (JUL 2022).

HONORS & AWARDS

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| • MBZUAI MSc & PhD Fully Funded Fellowship | 2021-2027 |
| • UAE Golden Visa for Talented Persons/Specialists in Science | 2022 |
| • MBZUAI Award of Appreciation for Iconic Representation and Student Hospitality | 2022 |
| • ProjectSet Innovation Challenge for Entrepreneurship (ICE-22) | 2022 |
| • Top 100, DeepLearning.AI Data-Centric AI Competition | 2021 |
| • NYSC-FRSC Award for the Most Creative Corp Member | 2017 |
| • 2015 AUE-NACOSS Award for the Best Programmer | 2015 |

PROFESSIONAL DEVELOPMENT

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| • Microsoft Azure | • Google Cloud | • Machine Learning |
| • Deep Learning | • IBM AI & Data Science | • MLOps |
| | | • Mind & AI |

REFERENCES

- Prof. Abdulmotaleb El Saddik - Enterprise Professor, MBZUAI & UOttawa - a.elsaddik@mbzuai.ac.ae.
- Prof. Kun Zhang - Professor, MBZUAI & Carnegie Mellon University - kun.zhang@mbzuai.ac.ae.
- Dr. Karthik Nandakumar - Associate Professor, MBZUAI - karthik.nandakumar@mbzuai.ac.ae.