

Curriculum Vitae

Dr. Olalekan Joel Awujoola

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Google Scholar Citation: <https://scholar.google.com/citations?user=resWmX8AAAAJ&hl=en>

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Personal Website: <http://www.olalekan.com.ng>

Professional Summary

A seasoned Chief System Analyst and Programmer with over two decades of experience at the Nigerian Defence Academy, specializing in technological innovation, computational modeling, and algorithm development. Ph.D. in Computer Science with expertise in machine learning, deep learning, artificial intelligence, and their applications in healthcare (e.g., breast cancer, brain tumors, leukemia detection) and cybersecurity (e.g., network intrusion detection, malware classification). Proven track record of leading research projects, developing innovative AI-driven solutions, and mentoring teams. Passionate about leveraging advanced models to address real-world challenges and drive impactful outcomes.

Key Skills

- **Machine Learning & AI Tools:** TensorFlow, PyTorch, scikit-learn, Keras, Matplotlib, Seaborn
- **Programming Languages:** Python, PHP, SQL
- **Data Analysis & Visualization:** Microsoft Excel, Principal Component Analysis (PCA), t-SNE
- **Healthcare Applications:** Medical imaging, disease prediction, genomic data science
- **Cybersecurity:** Network intrusion detection, malware detection, digital forensics
- **Project Management:** Team leadership, curriculum design, software development lifecycle

Keywords: Machine Learning, Deep Learning, Artificial Intelligence, Predictive analytics, Federated learning, Image processing, Postdoctoral

Education

Ph.D. in Computer Science *(September 2024)*

Nigerian Defence Academy, Kaduna

Specialization: Machine Learning, Cybersecurity, Artificial Intelligence, Big Data, Deep Learning

Master of Science (M.Sc.) in Computer Science *(2016)*

Ahmadu Bello University, Zaria

Master of Science (M.Sc.) in Nuclear and Radiation Physics *(2012)*

Nigerian Defence Academy, Kaduna

Master of Science (M.Sc.) in Information Technology *(2024)*

National Open University of Nigeria

Bachelor of Technology in Mathematics Education with Computer Science *(1995–1998)*

Federal University of Technology, Minna, Niger State

Nigerian Certificate in Education (NCE) in Mathematics/Physics *(1990–1993)*

Institute of Education, Ahmadu Bello University, Zaria

West African School Certificate (W.A.S.C) O'Level *(1983–1989)*

Bishop Onabanjo High School, New Bodija, Ibadan, Oyo State

Professional Experience

Chief System Analyst / Programmer

Nigerian Defence Academy, Kaduna

August 2001 – Present

- Led the development and implementation of machine learning models for real-world challenges, including healthcare diagnostics and cybersecurity solutions.
- Authored numerous peer-reviewed journal articles and book chapters on AI, deep learning, and computational modeling.
- Designed and implemented scalable systems for predictive analytics, enhancing operational efficiency and decision-making processes.
- Mentored junior staff and trained cadets in formal methods of software development, net-centric computing, operating systems, and data communication.

Adjunct Lecturer (Computer Science Department)

Nigerian Defence Academy, Kaduna

2013 – Present

- Courses: Formal methods of software development, Net-centric computing, Operating systems, and Data communication.
- Developed curricula and training programs to equip cadets with foundational and advanced technical skills.

❖ Research Contributions

❖ Journal Articles

- Awujoola, J. O., Nwodo, J. A., & Awujoola, E. A. (2025). Optimizing machine learning age prediction models for forensic applications using PCA and t-SNE: Insights from miRNA and circRNA analysis. *Sule Lamido University Journal of Science & Technology*, 10(2), 127–140. <https://doi.org/10.56471/slujst.v10.i2.122>.
- Chinyio, D. T., Awujoola, O. J., Adelegan, O. R., Chinyio, C. D., & Aminu, H. (2025). Enhancing URL-based phishing detection using hybrid data balancing and advanced machine learning classifiers. *Journal of Statistical Sciences and Computational Intelligence Volume*, 1(3), 248-261. <https://doi.org/10.64497/jssci.109/ssci.org/index.php/pub>
- Ado, A., Awujoola, O. J., Abdullahi, S. D., & Ibrahim, S. H. (2025). Integration of layer-wise relevance propagation, recursive data pruning, and convolutional neural networks for improved text classification. *FUDMA JOURNAL OF SCIENCES*, 9(2), 35-41.
- Abioye, O. A., Ewwiekpaefe, A., Odion, P., & Awujoola, O. J. (2025). Improving Parkinson's Diagnosis: A Stacked Ensemble Learning with Vocal Biomarkers and Data Balancing. *IT Journal Research and Development*, 10(1), 67-82.
- SH Ibrahim, ID Muraino, S Danlami, OJ Awujoola (2025): Mitigating Class Imbalance in Tuberculosis Detection: Combining Smote and Tomek Link with Modified Focal Loss and Class Weighting In a Transfer Learning Framework. *FUDMA JOURNAL OF SCIENCES* 9 (7), 226-234.
- Abioye, O. A., Ewwiekpaefe, A. E., & Awujoola, A. J. (2024). Performance evaluation of efficientnetv2 models on the classification of histopathological benign breast cancer images. *Science Journal of University of Zakho*, 12(2), 208-214.
- Nige Salihu, MN Musa, AJ Olalekan (2024): A Combined Approach Of Adasyn And Tomeklink For Anomaly Network Intrusion Detection System Using Some Selected Machine Learning Algorithms. *International Journal of Web Research* 7 (4), 51-64
- Ukorah, I. N., Owolabi, A. J., Ali, H., Onimisi, M. Y., Tafida, R. A., Olalekan, A. J., ... & Ugbe, R. U. (2024). Investigating the Performance of TIN-Based Perovskite Solar Cell with Zinc Selenide as an ETM and Graphene as an HTM Using SCAPS-1D. *Progress in Physics of Applied Materials*, 4(2), 171-181.
- Owolabi, A. J., Ali, H., Ukorah, I. N., Onimisi, M. Y., Tafida, R. A., Awujoola, J. O., & Gambo, H. (2024). Investigating the performance of Tin-based perovskite solar cell with

Cadmium Sulphide as etm and graphene as htm using SCAPS-1D. *Physics and Chemistry of Solid State*, 25(4), 764-772.

- Enem, T. A., & Awujoola, O. J. (2023). Malware detection and classification using embedded convolutional neural network and long short-term memory technique. *Science World Journal*, 18(2), 204-211.
- Abioye, O., Thomas, S., Odimba, C., & Awujoola, O. J. (2023). Generic hybrid model for breast cancer mammography image classification using EfficientNetB2. *Duke University Journal of Physical and Applied Science*, 9(3b), 281-289. <https://doi.org/10.4314/dujopas.v9i3b.30>
- Awujoola, O. J., Odion, P. O., Ewwiekpaefe, A. E., & Obunadike, G. N. (2022). Multi-stream fast Fourier convolutional neural network for automatic target recognition of ground military vehicle. *Artificial Intelligence and Applications*.
- Awujoola, O. J., Odion, P. O., Ewwiekpaefe, A. E., & Obunadike, G. N. (2022). Multi-class dual-stream convolutional neural network for synthetic aperture radar automatic target recognition of ground military vehicle. *Journal of Scientific Research of the Banaras Hindu University*, 66(4), 107-113.
- Awujoola, O. J., Odion, P. O., Irhebhude, M. E., & Aminu, H. (2021). Performance evaluation of machine learning predictive analytical model for determining the job applicants employment status. *Malaysian Journal of Applied Sciences*, 6(1), 67-79. <https://doi.org/10.37231/myjas.2021.6.1.276>
- Awujoola, O. J., Ogwueleka, F. N., & Odion, P. O. (2020). Effective and accurate bootstrap aggregating (bagging) ensemble algorithm model for prediction and classification of hypothyroid disease. *International Journal of Computer Applications*, 176(39), 0975-8887. <https://doi.org/10.5120/ijca2020920542>

❖ Conference

- Olorunshola, O., Oluyomi, A., Jonathan, C., & Awujoola, O. J. (2022). *Synthetic minority over-sampling technique and resample approach for Android malware detection using tree-based classifiers*. In *Proceedings of the International Conference on Smart, Secure and Sustainable Nation (S3N'2022)* (pp. 459–470). Nigeria Computer Society. <https://library.ncs.org.ng/download/synthetic-minority-over-sampling-technique-and-resample-approach-for-android-malware-detection-using-tree-based-classifiers/>

- Awujoola, O. J., Francisca, O., Odion, P. O., & Martins, I. (2021). An intelligent homogenous model for prediction of network intrusion detection using synthetic minority over-sampling technique and local outlier factor. In *Proceedings of the 2020 LGT-ECE-UNN International Conference: Technological Innovation for Holistic Sustainable Development (TECHISD2020)*. May 2021.

❖ **Forthcoming Journal Articles (Under Review)**

- Awujoola O.J, Rangon Dutta, Deborah Popoola, (2025): Integrative Phylogenetic and Machine Learning Analysis for Breast Cancer Subtype Classification and Relationship Mapping Based on Gene Expression Profiles.

❖ **Book Chapters (Scopus):**

- Awujoola, O. J., Ogwueleka, F. N., Odion, P. O., Awujoola, A. E., & Adelegan, O. R. (2023). Genomic data science systems of prediction and prevention of pneumonia from chest X-ray images using a two-channel dual-stream convolutional neural network. In *Data Science for Genomics* (pp. 217-228). Academic Press.
- Awujoola, O. J., Ogwueleka, F. N., Irhebhude, M. E., & Misra, S. (2021). Wrapper-based approach for network intrusion detection model with combination of dual filtering technique of resample and SMOTE. In *Artificial Intelligence for Cyber Security: Methods, Issues and Possible Horizons or Opportunities* (pp. 139-167). Springer International Publishing. https://doi.org/10.1007/978-3-030-72236-4_6
- Awujoola, O. J., Enem, T. A., Francisca, O. N., Adelegan, O. R., Oluwasegun, A., Uwa, C. O., Akuboh, V. U., Olorunshola, O. E., & Hassan, H. (2023). Enhancing credit card fraud detection and prevention: A privacy-preserving federated machine learning approach with auto-encoder and attention mechanism. In L. D. & A. Tyagi (Eds.), *Privacy Preservation and Secured Data Storage in Cloud Computing* (pp. 405-429). IGI Global. <https://doi.org/10.4018/979-8-3693-0593-5.ch018>
- Awujoola, O. J., Aniemeka, T. E., Ogwueleka, F. N., Abioye, O. A., Awujoola, A. E., & Uwa, C. O. (2024). Improved breast cancer detection in mammography images: Integration of convolutional neural network and local binary pattern approach. In P. B. Maruthi, S. Prasad, & A. Tyagi (Eds.), *Machine Learning Algorithms Using Scikit and TensorFlow Environments* (pp. 221-248). IGI Global. <https://doi.org/10.4018/978-1-6684-8531-6.ch011>

- Awujoola, O. J., Aniemeka, T. E., Abioye, O. A., Awujoola, A. E., Ajakaiye, F., & Adelegan, O. R. (2024). Improving leukemia detection accuracy: Contrast limited adaptive histogram equalization-enhanced image preprocessing combined with ResNet101 and Haralick feature extraction. In A. Sharma, N. Chanderwal, S. Tyagi, P. Upadhyay, & A. Tyagi (Eds.), *Enhancing Medical Imaging with Emerging Technologies* (pp. 99-132). IGI Global. <https://doi.org/10.4018/979-8-3693-5261-8.ch007>
- Awujoola, J. O., Enem, T. A., Ogwueleka, F. N., Abioye, O., & Awujoola, E. A. (2024). Machine learning–driven digital twins for precise brain tumor and breast cancer assessment. In A. K. Tyagi (Ed.), *Advances in machine learning and healthcare applications* (Chap. 21). Wiley. <https://doi.org/10.1002/9781394287420.ch21>
- Awujoola, J. O., Enem, T. A., Ogwueleka, F. N., Abioye, O., & Adelegan, R. O. (2024). Machine learning–enabled predictive analytics for quality assurance in Industry 4.0 and smart manufacturing: A case study on red and white wine quality classification. In *Industry 4.0, smart manufacturing, and industrial engineering* (1st ed., p. 33). CRC Press. <https://doi.org/10.4324/9781003473886>
- Oluwasegun, A., Olalekan, Awujoola, J., Musa, M. N., Ene, O. S., Shu'aibu, M., Nwuku, Y. E., & Bright, A. O. (2025). Optimized Binary and Multi-Class Classification With Biomarker Detection in Brain Cancer Gene Expression: Using Catboost and Principal Component Analysis. In *Spatially Variable Genes in Cancer: Development, Progression, and Treatment Response* (pp. 315-360). IGI Global Scientific Publishing.
- Oluwasegun, A. A., Ewwiekpaefe, A., Odion, P. O., Olalekan, Awujoola, J., Bright, A. O., Racheal, A. O. & Malami, M. G. (2025). Optimizing Healthcare Operations With AI Algorithms by Enhancing Skin Cancer Diagnosis Using Advanced Image Processing and Classification Techniques. In *AI-Driven Innovation in Healthcare Data Analytics* (pp. 235-276). IGI Global Scientific Publishing.
- Awujoola, J. O., Enem, T. A., Owolabi, J. A., Akusu, O. C., Abioye, O., & Adelegan, R. O. (2025). Machine learning and predictive maintenance in smart grids. In S. Tiwari & A. Kumar Tyagi (Eds.), *AI and Blockchain in Smart Grids: Fundamentals, Methods, and Applications* (1st ed., pp. 36). Auerbach Publications. <https://doi.org/10.1201/9781003500391>
- Awujoola, O. J., Enem, T. A., Owolabi, J. A., Akusu, O. C., Abioye, O., Awujoola, E. A., & Adelegan, R. O. (2025). Exploring the intersection of quantum neural networks and classical neural networks for early cancer identification. In A. K. Tyagi, S. Tiwari, & S. V. Nagaraj (Eds.), *Quantum computing: The future of information processing* (pp. 147-

168). CRC Press, Taylor & Francis Group LLC. <https://doi.org/10.1201/9781003499459-9>.

- Awujoola, Olalekan Joel, Abidemi Elizabeth Awujoola, Olayinka Racheal Adelegan, Aniemeka Theophilus Enem, and Oluwasegun Abiodun Abioye (2025). "Machine learning-based predictive modeling for brain tumor analysis in a society 5.0 framework." In *Human-Centric Integration of Next-Generation Data Science and Blockchain Technology*, pp. 127-146. Academic Press, 2025.. <https://doi.org/10.1016/B978-0-443-33498-6.00025-X>

Certifications

- **International Computer Driving License (ICDL)** (*March 12, 2021*)

Professional Memberships

- Cyber Security Experts' Association of Nigeria (*Membership ID: 340361*)

Awards and Honors

- Commendation for electronic transcripts software design and development, Nigerian Defence Academy (*March 13, 2012*)

Technical Projects

- **AI-Driven Healthcare Solutions:** Developed predictive models for breast cancer, leukemia, and pneumonia detection using CNNs, ResNet101, and federated learning.
- **Cybersecurity Innovations:** Created robust algorithms for malware detection and credit card fraud prevention using auto-encoders and attention mechanisms.
- **Smart Manufacturing Analytics:** Designed predictive analytics systems for quality assurance in Industry 4.0 using machine learning techniques.

Referees

- Dr. Joshua Adeyemi Owolabi, Physics Department, Nigerian Defence Academy, +234 703 169 9937, jaowolabi@nda.edu.ng
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