Samson Odan

Curriculum Vitae

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Odanson

Education

2023–2024 **MSc in Artificial Intelligence and Adaptive Systems**, *University of Sussex*, Brighton, UK
Graduated with distinction
Thesis: *Complexity Measures in Diverse Dynamical Regimes and Application to States of Consciousness*
Supervisor: Dr. Adam B. Barrett

2009–2014 **B.Eng in Mechanical Engineering**, *Ahmadu Bello University*, Zaria, Nigeria
Graduated with a 2:1
Thesis: *Design, Fabrication and Testing of a Solar Powered Egg Incubator*

2003–2009 **High School**, *Christ Comprehensive Schools*, Kaduna, Nigeria
Best Graduating Student

Research Experience

08/2024–Present **Research Collaborator**, *MESEC, Mediterranean Society for Consciousness Science*, Corsica, France, with Prof. Dumas Guillaume
Project: *Exploring Consciousness through Social Interactions: A Neuro-AI Approach*
- Investigating how social interactions may shape consciousness.
- Focusing on computational modeling and hyperscanning techniques to explore inter-brain neural correlates and the potential impact of inter-personal dynamics on intra-personal consciousness.

04/2024–09/2024 **Research Assistant**, *Sussex Centre for Consciousness Science, University of Sussex*, Brighton, UK, Department of Informatics, with Dr. Adam B. Barrett
Project: *Complexity Measures and States of Consciousness*
- Investigated how statistical complexity and Lempel-Ziv complexity distinguish different states of consciousness using intracranial depth electrode (iEEG) recordings from patients.
- Analyzed iEEG data during wakefulness, sleep stages, and psychedelic-induced states, identifying how complexity measures reflect neural dynamics.
- Explored the role of information richness and integration in consciousness, contributing to the understanding of the entropic brain hypothesis and integrated information theory.

10/2023–01/2024 **Lab. Assistant**, *Chichester I Lab., University of Sussex*, Brighton, UK, with Dr. Chris Johnson
Project: *Towards Adaptive Machines: Synaptic Homeostasis in Robotics*
- Applied Continuous-Time Recurrent Neural Networks (CTRNNs) for robotic adaptability in line-following tasks.
- Simulated navigation in CoppeliaSim, exploring synaptic scaling to adjust weights for consistent speed in varying environments.

2012–2014 **Teaching Assistant**, *Ahmadu Bello University*, Zaria, Nigeria
Led tutorials on Mathematics, CAD Design (SolidWorks, AutoCAD), and Programming (MatLab, JavaScript).

Industry Experience

09/2024–Present **AI Math Trainer (Remote)**, *Outlier AI*, York, UK
Apply mathematical expertise to train and evaluate generative AI models. Verify the accuracy and relevance of AI-generated mathematical content, develop complex math problems, and assess the quality of model responses to ensure precision and consistency.

02/2020–09/2023 **Data Specialist**, *UBA Group*, Lagos, Nigeria
Led large-scale data analysis projects, implementing machine learning models and advanced statistical techniques to improve business decision-making and customer value strategies.

06/2019–10/2019 **Data Analyst Intern**, *Dataville Research LLC*, Lagos, Nigeria
Analyzed regional survey data for poverty reduction initiatives, developing a data management system to track key metrics and generate reports for bilateral donors and NGOs, contributing to evidence-based strategies in underdeveloped regions.

Publications and Preprints

2024 **Odan, S.**, & Barrett, A. (Supervisor) (2024). Complexity Measures in Diverse Dynamical Regimes and Their Application to States of Consciousness. *Mathematical and Computational Biology*, DOI: 10.20944/preprints202410.0649.v1.

2024 **Odan, S.** (2024). Metaheuristic Method for Solving Systems of Equations. *Neural and Evolutionary Computing (cs.NE), arXiv:2409.16958*, DOI: 10.48550/ARXIV.2409.16958.

Conferences and Talks

11/2024 **Poster Presentation**, *Statistical Physics of Cognition Workshop*, Institute of Physics, London, UK
Presented work on "Complexity Measures in Diverse Dynamical Regimes and Application to States of Consciousness," showcasing an information-theoretic analysis of brain dynamics using measures.

10/2024 **Poster Presentation**, *Sussex Centre for Consciousness Science, New Lab Launch*, University of Sussex, Brighton, UK
Presented work on "Complexity Measures in Diverse Dynamical Regimes and Application to States of Consciousness", comparing behaviors of Statistical Complexity and Lempel-Ziv in simulated and experimental data.

09/2024 **Oral Presentation**, *Mediterranean Society for Consciousness Science (MESEC) Workshop 2024*, Corsica, France, Chaired by Prof. Thomas Metzinger.
Co-presented with Prof. Dumas Guillaume on "Exploring Consciousness through Social Interactions: A Neuro-AI Approach."

Awards and Scholarships

2023 Sussex Nigeria Scholarship, University of Sussex

2012 Innovative Young Engineers Award, Nigerian Society of Engineers, ABU Zaria

2003–2006 Full Scholarship, Christ Comprehensive Schools, Kaduna

Skills

Programming Languages & Frameworks	Proficient in Python (advanced), Julia (intermediate), MatLab (intermediate), JavaScript (intermediate). First experiences in Java and Lua. Frameworks: JAX, TensorFlow, PyTorch, Keras, scikit-learn, DEAP.
Data Analysis	Time Series (EEG/MEG) Analysis, Data Compression (Lempel-Ziv Comprehension Algorithm), Feature Extraction, Source Localisation and Connectivity Analysis (Granger Causality), Signal Processing (Entropy Measurement), Dimensionality Reduction (PCA)
Machine Learning	Natural Language Processing, Ensemble Learning (Random Forest and Gradient Boosting), Deep Learning, Support Vector Machines, Model Optimisation, experience with Distributed Training on GPUs
Robotics & Autonomous Systems	Dynamical Systems, Adaptive Control Algorithms, Evolutionary Algorithms, Sensorimotor Integration, Reinforcement Learning, Autonomous Navigation
Software & Tools	Version Control (Git), Robot Simulation (Webots, CoppeliaSim, Pygame), Design (AutoCAD, SolidWorks, Adobe Creative Suite), MS Office, Data Management and Analysis (SQL, Excel, R(basic)), MS Power BI
Research Techniques	Literature Search, Experimental Design, Data Collection Methods, Statistical Analysis, Hypothesis Testing, Scientific Writing, Public Presentation, Manuscript Preparation, Cross-Disciplinary Teamwork
Languages	English (Fluent), Igede (Native), Yoruba (Basic).

Extracurricular Activities

2024–Present Member, Mediterranean Society for Consciousness Science (MESEC), Corsica, France

2024–Present Founding Member, Consciousness Society Sussex, University of Sussex, Brighton, UK