Oladayo S. AJANI

Postdoctoral Research Associate

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Kyungpook National University,
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Education

2021–2024 **Ph.D., Artificial Intelligence**, *Kyungpook National University*, Daegu, South Korea.
Ph.D. Thesis: Evolution strategies-based learning algorithms for Single and Multi-Objective Reinforcement Learning
Relevant Courses: Reinforcement Learning, Soft Computing, Computational Intelligence, Computer Vision, Special Topics in Robotics.
CGPA: 4.13/4.30

2018–2020: **M.Eng., Mechatronics and Robotics**, *Egypt-Japan University of Science and Technology, Egypt*.
M.Sc. Thesis: Development of an Autonomous Assistive Robotic System for Care Tasks around the Head of Disabled People.
Relevant Courses: Robot Kinematics, Dynamics and Control, Intelligent Control Systems, Learning Algorithms and Neural Network, Mechatronics Systems Design, Digital Image Processing.
CGPA: 3.73/4.00

2010–2015 : **B.Eng., Computer Engineering**, *Federal University of Technology Minna, Nigeria*.
Honors: Best Graduating Student Computer Engineering Department.
Relevant Courses: Digital Image Processing, Mechatronics, Embedded Systems, Algorithms, Data Structures, Computer Programming and Languages, Engineering Mathematics.
CGPA: 4.30/5.0

Publications

A. *Relevant Published International Journal Articles* (*Google Scholar*)

2025 **Oladayo S. Ajani**, Ivan Fenyom, Daison Darlan, and Rammohan Mallipeddi. Prediction-guided multi-objective reinforcement learning with corner solution search. ***Computers and Electrical Engineering***, volume 122, page 109964, 2025, **(SCIE : Q1)**.

2025 Abhishek Kumar, **Oladayo S. Ajani**, Swagatam Das, and Rammohan Mallipeddi. Entropy-weighted medoid shift: An automated clustering algorithm for high-dimensional data. *Applied Soft Computing*, volume 169, page 112347, 2025, **(SCIE : Q1)**.

2024 **Oladayo S. Ajani**, Abhishek Kumar, and Mallipeddi Rammohan. Covariance matrix adaptation evolution strategy based on correlated evolution paths with application to reinforcement learning. *Expert Systems with Application*, 2024, **(SCIE : Q1)**.

2024 **Oladayo S. Ajani**, Dzeuban Fenyom Ivan, Daison Darlan, PN Suganthan, Kaizhou Gao, and Rammohan Mallipeddi. Deep reinforcement learning as multiobjective optimization benchmarks: Problem formulation and performance assessment. *Swarm and Evolutionary Computation*, volume 90, page 101692. Elsevier, 2024, **(SCIE : Q1)**.

2024 **Oladayo S. Ajani**, Daison Darlan, Dzeuban Fenyom Ivan, and Rammohan Mallipeddi. Multi-indicator based multi-objective evolutionary algorithm with application to neural architecture search. *International Journal of Machine Learning and Cybernetics*, 8 2024, **(SCIE : Q2)**.

2024 Yanjie Song, Yutong Wu, Yangyang Guo, Ran Yan, Ponnuthurai Nagaratnam Suganthan, Yue Zhang, Witold Pedrycz, Swagatam Das, Rammohan Mallipeddi, **Oladayo S. Ajani**, and Qiang Feng. Reinforcement learning-assisted evolutionary algorithm: A survey and research opportunities. *Swarm and Evolutionary Computation*, volume 86, page 101517, 2024, **(SCIE : Q1)**.

2024 Yonggik Kim, Seokho Kang, **Oladayo S. Ajani**, Rammohan Mallipeddi, and Yushin Ha. Predicting early mycotoxin contamination in stored wheat using machine learning. *Journal of Stored Products Research*, volume 106, page 102294. Elsevier, 2024, **(SCIE : Q1)**.

2024 Seokho Kang, Yonggik Kim, **Oladayo S. Ajani**, Rammohan Mallipeddi, and Yushin Ha. Predicting the properties of wheat flour from grains during debranning: A machine learning approach. *Heliyon*, page e36472, 2024, **(SCIE : Q1)**.

2024 Nazarov Jasurbek, Dzeuban Fenyom Ivan, **Oladayo S. Ajani**, and Rammohan Mallipeddi. Genetic algorithm guided image channel selection for skin lesion segmentation. *IEEE Access*, pages 1–1, 2024, **(SCIE : Q2)**.

2024 Dzeuban Fenyom Ivan, Daison Darlan, Adeyinka Adedigba, **Oladayo S. Ajani**, Rammohan Mallipeddi, and Hwang Jae Joo. Priority-encoder ensemble for speech recognition. *IEEE Access*, pages 1–1, 2024, **(SCIE : Q2)**.

2024 Esther Tolulope Aboyeji, **Oladayo S. Ajani**, and Rammohan Mallipeddi. Covariance matrix adaptation evolution strategy based on ensemble of mutations for parking navigation and maneuver of autonomous vehicles. *Expert Systems with Applications*, volume 249, page 123565, 2024, **(SCIE : Q1)**.

2023 **Oladayo S. Ajani**, Member Joy Usigbe, Esther Aboyeji, Daniel Dooyum Uyeh, Yushin Ha, Tusan Park, and Rammohan Mallipeddi. Greenhouse micro-climate prediction based on fixed sensor placements: A machine learning approach. ***Mathematics***, volume 11, 2023, **(SCIE : Q1)**.

2023 **Oladayo S. Ajani**, Hammed Obasekore, Bo-Yeong Kang, and Mallipeddi Rammohan. **Robotic Assistance in Radiology: A Covid-19 Scenario**. ***IEEE Access***, volume 11, pages 49785–49793, 2023, **(SCIE : Q2)**.

2023 **Oladayo S. Ajani** and Rammohan Mallipeddi. Pareto-based dynamic difficulty adjustment of a competitive exergame for arm rehabilitation. ***International Journal of Human-Computer Studies***, volume 178, page 103100, 2023, **(SCIE : Q1)**.

2023 **Oladayo S. Ajani**, Sung-ho Hur, and Rammohan Mallipeddi. Evaluating domain randomization in deep reinforcement learning locomotion tasks. *Mathematics*, volume 11, 2023, **(SCIE : Q1)**.

2023 **Oladayo S. Ajani**, Esther Aboyeji, Rammohan Mallipeddi, Daniel Dooyum Uyeh, Yushin Ha, and Tusan Park. A genetic programming-based optimal sensor placement for greenhouse monitoring and control. ***Frontiers in Plant Science***, volume 14, 2023, **(SCIE : Q1)**.

2023 Jeewon Park, **Oladayo S. Ajani**, and Rammohan Mallipeddi. Optimization-based energy disaggregation: A constrained multi-objective approach. ***Mathematics***, volume 11, 2023, **(SCIE : Q1)**.

2023 Esther Aboyeji, **Oladayo S. Ajani**, and R. Mallipeddi. Effect of number of lanes on traffic characteristics of reinforcement learning based autonomous driving. *IEEE Access*, volume 11, pages 80199–80206, 2023, **(SCIE : Q2)**.

2022 **Oladayo S. Ajani** and Rammohan Mallipeddi. Adaptive evolution strategy with ensemble of mutations for reinforcement learning. ***Knowledge-Based Systems***, volume 245, page 108624, 2022, **(SCIE : Q1)**.

2021 **Oladayo S. Ajani** and Samy FM Assal. Development of an autonomous robotic system for beard shaving assistance of disabled people based on an adaptive force tracking impedance control. ***Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science***, volume 235, pages 5758–5775, 2021, **(SCIE : Q3)**.

2020 **Oladayo S. Ajani,** and Samy F. Assal. Hybrid force tracking impedance control-based autonomous robotic system for tooth brushing assistance of disabled people. ***IEEE Transactions on Medical Robotics and Bionics***, volume 2, pages 649–660, 2020, **(SCIE : Q2)**.

B. *Articles Under Review*

202x **Oladayo S. Ajani and Sri Srinivasa Raju and Rammohan Mallipeddi**, An Indicator-based Evolutionary Algorithm for Constrained Multi-objective Optimization, In *Applied Soft Computing*.

C. *International Conference Proceedings*

2023 **Ajani, Oladayo S**., Dzeuban Fenyom Ivan, and Rammohan Mallipeddi. Gaussian adaptation with decaying matrix adaptation weights. In *2023 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–7, 2023.

2023 Dzeuban Fenyom Ivan, Oladayo S Ajani, and Rammohan Mallipeddi. An optimal re-parametrization scheme for generalization in reinforcement learning. In *2023 14th International Conference on Information and Communication Technology Convergence (ICTC)*, pages 13–17. IEEE, 2023.

2023 Daison Darlan, **Ajani, Oladayo S.**, Victor Parque, and Rammohan Mallipeddi. Recognizing social touch gestures using optimized class-weighted cnn-lstm networks. In *2023 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, pages 2024–2029, 2023.

2023 Daison Darlan, **Ajani, Oladayo S.**, and Rammohan Mallipeddi. Lunar landing site selection using machine learning. In *2023 International Conference on Machine Intelligence for GeoAnalytics and Remote Sensing (**MIGARS**)*, volume 1, pages 1–4. IEEE, 2023.

2023 Esther Aboyeji, Oladayo S Ajani, and Rammohan Mallipeddi. On the scalability of parking trajectory optimization of autonomous ground vehicles. In *2023 14th International Conference on Information and Communication Technology Convergence (ICTC)*, pages 344–349. IEEE, 2023.

2022 Abhishek Kumar, **Ajani, Oladayo S.**, Swagatam Das, and Rammohan Mallipeddi. Gridshift: A faster mode-seeking algorithm for image segmentation and object tracking. In *2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, pages 8121–8129. IEEE, 2022.

2019 **Oladayo, Ajani S.**, F. M. Samy Assal, and Haitham El-Hussieny. Towards development of an autonomous robotic system for beard shaving assistance for disabled people. In *2019 IEEE International Conference on Systems, Man and Cybernetics (**SMC**)*, pages 3435–3440. IEEE, 2019.

2019 **Ajani, Oladayo S.** and Haitham El-Hussieny. An anfis-based human activity recognition using imu sensor fusion. In *2019 Novel Intelligent and Leading Emerging Sciences Conference (**NILES**)*, volume 1, pages 34–37. IEEE, 2019.

2019 Victor Parque, Hammed Obasekore, **Oladayo, Solomon**, and Tomoyuki Miyashita. On planning distributed minimal sensor networks. In *2019 IEEE 1st Global Conference on Life Sciences and Technologies (**LifeTech**)*, pages 26–28. IEEE, 2019.

2019 Victor Parque, Hammed Obasekore, **Oladayo, Solomon**, and Tomoyuki Miyashita. Benchmarking learning networks on eat-sleep conditions. In *2019 IEEE 1st Global Conference on Life Sciences and Technologies (**LifeTech**)*, pages 29–30. IEEE, 2019.

2019 Hammed Obasekore and **Ajani, Oladayo S.** Using sedentary activity classification model to illustrate an adaptable freelance workspace. In *2019 7th International Japan-Africa Conference on Electronics, Communications, and Computations, (**JAC-ECC**)*, pages 72–75. IEEE, 2019.

Patents

2023 **No.C-2023-051898**, *Korea Alpha System Co., Ltd, Rammohan Mallipeddi,* ***Oladayo S. Ajani****, Dzeuban Fenyom Ivan and Daison Darlan* , Anomalous Vehicle Detection and Alerting System using CCTV Camera Network. November, 2023.

Fellowships & Awards

2023 ***Best Paper Award***: The 14th International Conference on ICT Convergence 2023, Jeju Island, Korea.

2021–2023 ***Brain Korea (BK21) Scholarship*** National Research Foundation of Korea (NRF), as a PhD research scholar in Kyungpook National University, South Korea.

2021–2023 ***Kings Scholarship*** Kyungpook National University, as a PhD research scholar in Kyungpook National University, South Korea.

2018–2020 ***Egyptian Ministry of Higher Education (MoHE) Scholarship*** as a M.Sc research candidate in Egypt-Japan University of Science and Technology Egypt.

Research Experience

Postdoctoral Research Associate, Department of Artificial Intelligence, Kyungpook National University, Daegu, Republic of Korea

August, 2024 – Present **Water Industrial Complex Research Center, Institute of Engineering and Technology, Kyungpook National University**, *Funded through Basic Research laboratory Funds Granted by National Research Foundation (NRF) South Korea.*.

Research Focus: Algorithm development for multi-objective reinforcement learning with applications to Dynamic Game difficulty adjustment.

June, 2024 – July, 2024 **Evolutionary Computation and Intelligent Systems Laboratory, (Volunteering)**, *Department of Artificial Intelligence*.

Research Focus: National Research Foundation (NRF) grant preparation

March, 2024 – May, 2024 **Smart Agriculture Innovation Center, Agricultural Science Research Institute, Kyungpook National University**, *Funded through Institute of Information & communications, Technology Planning & Evaluation (IITP) grant funded by the Korea government*.

Research Focus: Developed AI-based techniques for a smart unnamed issuance solution for digital inclusion under an industry-academic corporation .

- Authored/co-authored over seven (7) SCIE articles in high-impact journals.
- Successful technology transfers and patents claims.
- Supervised and mentored graduate students and research assistants.

Lead Researcher, Development of AI-based Smart Unmanned Issuance Solution for Digital Inclusion.

June, 2023 – May, 2024 ***Consortium between Kyungpook National University and Gwangmyeong Tech Co., Ltd. (GMTech), South Korea***, *Funded through Institute of Information & communications, Technology Planning & Evaluation (IITP) grant funded by the Korea government(MSIT). (No.RS-2023-00262841)*.

- Led a team of eight (8) researchers in a collaborative effort with the company research team to design Face detection, age, and gender classification module, Gestures recognition module, voice recognition module, and eye tracking model to enable an AI-based Smart Unmanned Issuance Solution.
- Successful technology transfer, patent claim, KAIC certification, and two journal articles.

PhD Research Fellow, Department of Artificial Intelligence, Kyungpook National University, Daegu, Republic of Korea.

June 2021 – Feburary, 2024

Evolutionary Computation and Intelligent Systems Laboratory, *Funded through Kyungpook National University Kings Scholarship and National Research Foundation(NRF).*

Research Focus: Development of Novel Evolution strategies-based learning algorithms for Single and Multi-Objective Reinforcement Learning.

- Conducted multi-domain research in reinforcement learning, computational intelligence, and computer vision with applications to robotics, games, and agriculture.
- Successful technology transfers, patents, multiple industry-academic corporation-based proof of concepts.
- Supervised and mentored graduate students and research assistants.

Advisor: **Prof. Rammohan Mallipeddi**, *Professor, Department of Artificial Intelligence*, KNU

Lead Researcher, A real-time warning system using deep learning-based vehicle identification and tracking technology to prevent traffic accidents.

June, 2023 – December, 2023

Consortium between Kyungpook National University and Korea Alpha System Co., Ltd, South Korea, *funded through Daegu Techno Park (DGTP) 2023 Regional Innovation Centered University Research Activity Support Project*.

- Led a team of four (4) researchers to design a Yolo-7-based vehicle detection and tracking with the capability of vehicle behavior analysis and re-identification to facilitate accident prevention.
- Successful technology transfer and patent publication.

Research Assistant, Multi-Objective Energy-Efficient Thermal Comfort Control in Buildings Via Reinforcement Learning

June, 2022 – July, 2023

KNU-LG Electronics Convergence Research Center, Kyungpook National University, South Korea., *Funded through Basic Laboratory fund Supported by National Research Foundation (NRF).*

- Proposed an evolutionary multi-objective framework for the neuroevolution of multi-objective Reinforcement learning policy search for Energy-Efficient Thermal Comfort Control in Buildings

Advisor : **Prof. Lee, Min-Ho**, *Professor, Department of Artificial Intelligence*, Kyungpook National University, South Korea.

Teaching Experience

Graduate Teaching Assistant, Department of Artificial Intelligence, Kyungpook National University South Korea.

June, 2021 – February, 2024

Graduate and Undergraduate Courses.
Lectured selected topics within each of the courses.
lead the students through hands-on implementation and training of several learning networks.
Successfully conducted students' assessment, examination, and collation of results.

Courses: *Basic Optimization Theory, Mathematics for AI, Computational Intelligence.*

Lecturer, Department of Computer and Craft Studies, Government Technical College Osun state, Nigeria.

January, 2016 – 2017

Nigerian Youth Service Corps.
ICT course lecturer for year 1 and 3 students.
Successfully conducted students' assessment, examination, and collation of results.
Successfully conducted practical sessions for students at the Skill G- Laboratory.

Courses: *Information Communication Technology.*

Computer skills

Programming Languages	Python, Matlab, Latex
Deep Learning Frameworks	PyTorch, Keras, Fastai

Professional Activities and Membership

2019 – present	**Graduate Student Member, IEEE** , 96065200.
2022 – present	**Regular Reviewer**, Expert Systems with Applications, Swarm and Evolutionary Computation, IEEE Transactions on Systems, Man, and Cybernetics: Systems, Engineering Applications of Artificial Intelligence, Computers and Electrical Engineering.
2022–present	**Black in Artificial Intelligence** .

Referees

Prof. Rammoahn Mallipeddi
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Artificial Intelligence
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Prof. Ponnuthurai Nagaratnam Suganthan
Professor, Department of
Electronics and Communication Sciences
Qatar University.
✉ p.n.suganthan@qu.edu.qa

Prof. Haitham El-Hussieny
Professor of Robotics & AI, Department of
Mechatronics and Robotics,
Egypt-Japan University of Science and Technology Egypt.
✉ email: haitham.elhussieny@ejust.edu.eg