# Elisha A. KOMOLAFE

elishaayobami99@gmail.com eak0mo.github.io +(234)-708-2358-813 github.com/eak0mo

## Research Interests

Robot-assisted Stroke Rehabilitation, Computational Neuroscience, Brain-Computer-Interface, Reinforcement Learning.

## Education

**University of Cape Town** Sep 2025 –
M.Sc. Applied Mathematics
Undertaken with AIMS AI for Science Masters 2025-2026

**World Federation of Neurorehabilitation** Sep 2023 –Dec 2023
Teaching Course on Clinical Pathways in Stroke Rehabilitation
Relevant Coursework: Arm Rehabilitation, Mobility after stroke: Relearning to Walk

**Obafemi Awolowo University (O.A.U.),** Ile-Ife, Nigeria 2016 – 2022
Bsc. Electronic and Electrical Engineering. — GPA 3.97/5.00
Relevant Coursework: Control Systems Engineering I & II, Introduction to Modern Control, Intelligent Control and Instrumentation Engineering.

- **Dissertation Topic: "Design and development of a small scale bilateral rehabilitation robot for stroke rehabilitation and a low-cost force-torque sensor".** Supervised by Dr. K.P. Ayodele

**The Neurological Association of South Africa EEG Online** May 2020 – Nov 2020
Web Based Electroencephalography (EEG) Distance Learning Programme
Relevant Coursework: Principles of Electroencephalography, Application of Encephalography in Clinical Practice

## Research Experience

**Applied Artificial Intelligence and Robotics Research Lab $A^2IR^2$** Dec 2019 – Dec 2022
Research Assistant to Dr. K.P. Ayodele

- **Developed the data collection pipeline for a multi-axis load cell array.**
- **Engineered the impedance control system, pivotal to the development of hybrid end-effector rehabilitation robots, through a coordinated team effort.**

**Biosignal Processing, Instrumentation and Control Lab** Dec 2017 – Dec 2022
Undergraduate Research Assistant to Dr. K.P. Ayodele

- **Developed a Sequential logic for the operation of a IoT based network of weather stations**
- **Contributed to the testing and development of an EMG controlled orthosis**
- **Led the collaboration project on an autofocusing Microscope, and Implemented an Image detection algorithm**

## Teaching Experience

**Department of Electronic and Electrical Engineering O.A.U.** Nov – Dec, 2021
Teaching Assistant to Year II engineering lab

## Conferences

**AIMS Workshop and School on Quantum Learning Algorithms** Oct 2025
The Theory of Quantum Learning Algorithms

**Nigerian Society of Neurological Sciences (Annual Scientific Conference)** March 2022
Theme: Multidisciplinary Care and Collaboration in the Neurological sciences

**O.A.U. Faculty of Technology Conference 2019** Sep 2019
Theme: Diversification of Developing Economies

**Nigerian Federation for Neurorehabilitation (Sub-Saharan Regional Conference)** Dec 2018
Theme: Neurorehabilitation in Africa: Challenges and New Horizons

## Publications

Ayodele, K.P., Omolayo, I., **Komolafe, E.A.**, Jubril, A.M., Obreba, P., Ogunmodede, A., Olateju, E., Ajayi, O., Olaogun, M.O.B., & Komolafe, M.A. (2023). A Technique for End-Effector Force Estimation in Parallelogram Arm Robot using Link-Integrated Load Cells. FUOYE Journal of Engineering and Technology, 8(2). https://doi.org/10.46792/FUOYEJET.V8I2.1035

Ayodele, K.P., Omolayo, I., **Komolafe, E.A.**, Eghrudje, M., John, V. Determination of Human finger pose using kalman filtering for a articulated wearable hand orthosis. *(In Preparation)*

**Komolafe, E.A.**, Ayodele, K.P., Sanusi A.A, Ogunbona, P.O. (2023). A review on the structure and control techniques used in bilateral rehabilitation robots for stroke rehabilitation. *(In Preparation)*

## Summer Schools and Additional Training

**G.tec Medical Engineering Gmbh** 17 – 26 April 2023
BCI & Neurotechnology Spring School

**IBRO-SIMONS Computational Neuroscience Imbizo** Aug 2022 – Sep 2022
Cape Town, South Africa

- **Mini-project: "Exploring generic decoding of seen objects using visual features."** Using linear regression methods to decode seen images from brain activity in different regions.
- **Final-project: "Learning to walk in a simulation."** Trained a Actor2Critic agent to learn how to walk in the Bipedal Walker v-3 in Open Ai gym.

### Neuromatch Academy

**Deep Learning Course** July 2022
- **Project:Multi Agent Reinforcement Learning in Gambling and the effect on Group fMRI readings.** To utilize reinforcement learning to create a multi-agent simulation from single-person fMRI data.

**Computational Neuroscience Course** July 2020
- **Project: Decoding of the Visual Cortex using Kay-Gallant Dataset.** Decoding seen images from brain activation data using edge Detection and machine learning techniques.

## Other Publications and Presentations

**Komolafe, E.A.**, Ayodele, K.P., Sanusi A.A, Akinniyi, O.T, Ogunbona, P.O., Komolafe, M.A.. Review on the components of bilateral rehabilitation robots for stroke rehabilitation. Presented at the 17th World Stroke Congress

**PULSR V2.0** Oral presentation at the O.A.U. College of Health Sciences Research Fair 2021 on the second generation of the hybrid rehabilitation robot. (2021)

**Adaptive load cell calibration using Transfer learning** Oral presentation at the Applied Artificial Intelligence and Robotics Research lab group meeting (2020)

**Design and development of a motorized autofocusing microscope** Oral presentation for Group II course (2019)

**Overview of the effectiveness between Unilateral and Bilateral Rehabilitation robots** Oral presentation at the Applied Artificial Intelligence and Robotics Research lab group meeting (2019)

**Hybrid rehabilitation robots** Oral presentation at the Applied Artificial Intelligence and Robotics Research lab group meeting (2019)

Ayodele, K.P, Komolafe, M.A., Olugbon, F.J., **Komolafe, E.A.** (2019). A Myoelectric Robotic Orthosis For Hand Neuro-rehabilitation of Stroke Patients in resource-poor settings. Poster presentation at N.F.N.R. (2018).

**Climate modelling, Regional climate models of Africa** Oral presentation at the Applied Artificial Intelligence and Robotics Research lab group meeting (2018)

**Development of Laboratory Circuit boards for electronics experiment.** Oral defence for Group Design I course (2017)

## Awards and Honors

**Google DeepMind Scholar** 2025 – 2026

**Simons Trust Imbizo Follow Up Grant (STIFUG)** [$387] 2022

**IBRO-Simons Computational Neuroscience Imbizo Scholarship and Travel Grant** 2022

## Professional Societies

**World Stroke Organization** July 2025 - Present
Trainee Member

**ACM (Association for Computing Machinery)** Jan 2024 – Present
ACM Professional Membership

**WFNR (World Federation of Neurorehabilitation)** July 2022 – Present
Member of Special Interests groups: Young WFNR & Robotics

**ICORR (International Consortium for Rehabilitation Robotics)** Aug 2022– Present
Member

**Black in AI** Nov 2022 – Present
Member

## Work Experience

**MindForge** Sep 2024 - Jan 2025
AI Engineer

**BAATS Clinical Engineering Limited, Ibadan** Aug 2023 - Aug 2024
Graduate Engineering Intern

**Gilead Biomedical Engineering** Sep 2019 – Jan 2020
Undergraduate Intern to Dr. K.P. Ayodele
Projects:

- **Applications of Reinforcement Learning for Robotic control in a virtual environment.** researched in using reinforcement learning to train robots in the CoppeliaSim environment, worked on training the NAOqi robot in walking and the Uarm robot in picking a cylinder.
- **Repair of a faulty wheelchair car lift** Served as the Lead to diagnose the cause of the fault and fully repair the wheelchair lift.

**Faculty of Technology Conference OAUTekConf2019** Sep 2019
Assistant Technician

## Activities

**Institute of Electrical and Electronics Engineers - ( OAU Student Chapter)** 2017 – Dec 2020
Student member both R.A.S and C.I.S

**BR4IN.IO BCI Hackathon participation** April 2023
Participated in the 3 day hackathon working on the stroke rehab data analysis project.

## Software, Coding and Languages

**Software** LaTeX, Rhino 3D, Matlab, Corel Draw, k40D, Diagrams.Net

**Programming Languages** Python, C

**programming Frameworks** PyTorch, Scikit Learn, Farama Gymnasium, Langchain

**Languages** English, Yoruba