Ibrahim O. Jimoh

Artificial Intelligence & Robotics

ibjhmoh@gmail.com · linkedin.com/in/jimohibrahim24 · github.com/jimohib ·

RESEARCH INTERESTS

Machine learning, reinforcement learning, natural language processing, robot and autonomous systems learning and perception, social robotics.

EDUCATION

MSc, Engineering Artificial Intelligence Jul 2023 – May 2025
Carnegie Mellon University (CMU) Pittsburgh, USA
Specializations: Machine Learning, Deep Learning, NLP, Robotics
Capstone: Building an LLM Based Investment Advisor System using a Retrieval Augmented Generation (RAG) Architecture
Relevant Courses: Applied Stochastic Processes, Machine Learning for Engineers, Introduction to Deep Learning, Cognitive Robotics, Data Inference and Applied Machine Learning, AI System Design, Principles and Applications of AI, AI/ML Operations (AI/MLOPs), Humanoid Robotics and Cognition, Research Methods.

BEng, Computer Engineering Sep 2015 – Sept 2021
Federal University of Technology (FUT) Minna, Nigeria
Specialization: Software and Hardware Engineering
Thesis: Development of a Drowsiness Detection System for Road Accident Reduction and Control using Computer Vision Technique

RESEARCH EXPERIENCE

Research Associate Jun 2025 – Present
AI Robotics Laboratory, Culturally Sensitive Social Robotics CMU
- Developing a cultural knowledge base to be structured into a cultural ontology to guide robot interactions in a culturally attuned manner.
- Developing a robot localization software module to estimate a pepper robot's absolute position by triangulation and trilateration using visual landmarks in a known environment to guide its interaction and navigation.

Research Assistant Jun 2024 – May 2025
AI Robotics Laboratory, Culturally Sensitive Social Robotics CMU
- Investigated culturally sensitive robot behaviors through ethnographic research and identifying interaction patterns that are socially and culturally acceptable in Africa as a case study.
- Developed and implemented a Behavior Tree Domain Specific Language (DSL) for use case scenarios interaction of a robot with humans.
- Developed a software module for robot localization to determine its pose in a Cartesian world frame of reference by a combination of relative and absolute position estimation. Relative position estimation is achieved through odometry and the robot inertial measurement unit, while absolute position estimation is achieved by triangulation using ArUco markers as landmarks. We also investigated the use of Scale Invariant Feature Transform (SIFT) and YOLO for the development of functionality for the landmark recognition.

Research Assistant Jan 2021 – Sep 2021
Computer Engineering Laboratory, Computer Vision Driver Assistant and Detection System for Road Safety FUT
- Investigated the use of computer vision algorithms for developing system to better enhance vehicular road safety.
- Carried out survey and acquired statistics on vehicular road accident reports.
- Developed an in-vehicle installable system for detecting vehicle-driver drowsiness while driving with capabilities to trigger a sound alarm and send distress signal containing driver and vehicle information to nearest road safety authority. The system uses a Histogram of Oriented Gradient (HOG) facial predictor algorithm and eye aspect ratio for eye monitoring.

WORK EXPERIENCE

Software Engineer Intern Jan 2023 – Jun 2023
Optimus Bank Lagos, Nigeria
- Led as a project lead, coordinated project timelines, ensured deliverables were met, and fostered collaboration between development and business units.
- Served in a scrum master capacity, facilitating daily stand-ups, sprint planning, and retrospectives, resulting in improvement in team productivity and task completion rates.
- Designed and developed APIs for customer support virtual assistant, enabling seamless integration with the bank's existing infrastructure and improving service efficiency.
- Maintained data security and adhered to industry compliance standards, ensuring 100% regulatory compliance with banking security protocols.

IT Engineer Intern Jan 2022 – Dec 2022
Protogy Global Services Limited Ibadan, Nigeria

- Managed the company's meter software, including updates, maintenance, and utility performances.
- Enhanced production and time efficiency by more than 60% by developing a Python-based entry application software for product inventory.
- Resolved software and hardware related issues encountered by meters in the pipeline systems.
- Recognized as the best performing and most efficient intern in the company during this period.

Hardware and Software Technician May 2016 – May 2019
Canaanland Technologies Ilorin, Nigeria

- Maintained, troubleshot, and fixed computer systems and devices for corporate and individual clients.
- Provided technical support and software solutions for clients.
- Acquired a lot of knowledge about customer relations during the time spent in this role.

PUBLICATIONS & PRESENTATIONS

A. Akinade, D. Barros, E. Birhan, M. Danso, Y. Haile, **I. Jimoh**, C. Osano, P. Ranchod, M. Richard, B. Rosman, B. Shimelis, T. Tefferi, and D. Vernon, "Culturally Sensitive Social Robotics for Africa," *chapter in Cultural Robotics Book: Diversified Sustainable Practices*, Springer Nature [Under Review '25]

Abstract **I. Jimoh**, H. Equbay, C. Osano, T. Tefferi, and D. Vernon, "Behavior Trees for Culturally Sensitive Social Robots: African Culture Case Study," *Robotics in Africa Forum at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024.

Poster A. Akinade, D. Barros, M. Danso, Y. Haile, E. Birhan, B. Shimelis, C. Osano, P. Ranchod, M. Richard, B. Rosman, **I. Jimoh**, T. Tefferi, and D. Vernon, "Culturally Sensitive Social Robotics for Africa," *Cultural Robotics: Diversified Sustainable Practices, Workshop at IEEE/ACM Human Robot Interaction (HRI) Conference, 2025.*

Y. Underdue Murph, A. Avoka, **I. Jimoh**, and F. Rurangwa, "Breaking Mental Health Silence: Men from Different Cultures and Generations," *Case Studies in International Education*, Vol. 5 No. 2, Dec. 2024.

TECHNICAL SKILLS

Programming — Python, C++, C#, Java, JavaScript **AI & Machine Learning** — Pandas, NumPy, Scikit-Learn, PyTorch, TensorFlow, OpenAI API, RAG, LangChain **Analytics Tools** — Power BI, MS Excel, SQL **Robotics** — ROS, Gazebo, OpenAI Gym **Cloud Technology** — AWS, GCP, Docker, Kubernetes **Web Technologies** — HTML, CSS, Bootstrap, PHP **Web Frameworks** — Django, .NET **Developer Tools** — Git, GitHub, Linux, Ubuntu, Unity3D, LaTeX **Databases** — MySQL **Embedded Systems** — Arduino Programming, Raspberry Pi **Soft Skills** — Leadership, Communication and Presentation, Collaboration, Integrity

CONFERENCES & WORKSHOPS

IEEE/ACM Human Robot Interaction (HRI) Conference themed *Robots for a Sustainable World* Poster presentation of "Culturally Sensitive Social Robotics for Africa," in Cultural Robotics: Diversified Sustainable Practices Workshop, Melbourne, Australia, 2025.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Abstract presentation of "Behavior Trees for Culturally Sensitive Social Robots," in Robotics in Africa Forum Workshop, AbuDhabi, UAE, 2024.

Touch Sensing and Processing Summer (TSPSS) Workshop in Robotics Lectures and hands-on on robot tactile sensing and manipulation by experts in industry (Meta AI, TouchLab) and academia (Stanford, TU Dresden) in Dresden, Germany, 2024.

HONORS & AWARDS

HRI Conference Grant Award, *ACM SIGAI* 2025
Grant award to attend and present research work at the Human Robot Interaction conference in Melbourne, Australia, 2025.

Master's Degree Scholarship, *Mastercard Foundation* 2023
Awarded the Mastercard Foundation master degree scholarship.

Recognition Best School Representative, *International Mathematics Olympiad (IMO)* 2015
Recognized by my school for exemplary performance in the competition.

SELECTED PROJECTS

Deep Reinforcement Learning-Based Mobile Robot Navigation in Social Spaces Sep 2024 – Dec 2024
Developed a deep reinforcement learning-based framework for mobile robot navigation in social spaces that jointly models both human-robot and human-human interactions. Implemented a transformer-based architecture adept at capturing long-range dependencies for modeling complex interactions in dynamic crowds from a baseline model architecture that uses a self attention mechanism.

LLM-Based Investment Advisor using Retrieval-Augmented Generation (RAG) Sep 2024 – Dec 2024
Developed a scalable LLM-powered investment advisory platform that democratizes financial advising, including risk profiling, asset allocation, portfolio forecasting, and personalized recommendations.

Deepfake Voice Detection for Fraud Prevention Jun 2024 – Aug 2024
Developed and trained a deep convolutional neural network model to distinguish real and fake voice recordings.

Synchronizing Multimodal Behaviors and The Eva Robot Head Sep 2023 – Dec 2023
Built a responsive and expressive humanoid robot head using Unity, VR headset, and 3D printing with Fusion 360 and Ultimaker cura. Implemented facial expression recognition and mimicking using neural network models. Enhanced open-source Python code for robot head control.

LEADERSHIP, COMMUNITY SERVICE & EXTRACURRICULAR

AI Safety Collab, AI Alignment Facilitator Aug 2025 – Present
European Network for AI Safety
- Leading weekly discussion groups for international participants, ensuring clarity and engagement across diverse technical backgrounds.
- Translating complex AI safety concepts into accessible insights through guided discussions and exercises.
- Fostering collaborative learning and peer exchange on alignment strategies and governance.
- Gathering and synthesizing participant feedback to enhance facilitation quality and program impact.
- Contributing to the international AI Safety Collab initiative, fostering global collaboration in AI safety education.

Afrisnet Graduate Committee, Communications Officer Jun 2024 – Present
Afrisnet
- International community of African graduate and postdoctoral scholars promoting academic success.
- Organizing and communicating career and professional development workshops.
- Facilitated information sessions on research fellowships and job opportunities.

IEEE Student Branch, Interim Chair, Vice Chair May 2024 – May 2025
CMU
- Coordinated the activities of the branch on campus.
- Organized and participated in the IEEEXtreme 18.0 coding competition challenge.
- Drafted the student branch's annual plan report including activities and funding applications and opportunities.

Research Club, Community Engagement Manager Dec 2023 – Dec 2024
CMU
- Brought together the campus research community and advocated for research engagements.
- Engaged with faculty and students and established faculty-student research collaboration.
- Organized workshops, panel sessions, and research talks from faculty and invited external guests.

Solid Africa, Volunteer Dec 2023 – Dec 2023
- A non-profit organization that provides aid to the most vulnerable hospital patients in Africa.
- Made donations, visitation, and was actively involved in the distribution of relief materials and logistics process of reaching out to patients in Rwanda.

Google Developers Group, Member 2020 – Present
- Actively participated in meetups, workshops, and coding sessions, while contributing to hands-on projects, hackathons, and collaborative development initiatives.
- Regularly engaged in GDG local events to expand technical expertise, build community connections, and stay current with emerging technologies.

PROFESSIONAL AFFILIATIONS

Member, Association of Computing Machinery (ACM)
Graduate Member, Institute of Electrical and Electronics Engineers (IEEE)
Graduate Member, IEEE Robotics and Automation Society (IEEE-RAS)
Graduate Member, Nigeria Society of Engineers (NSE)

PERSONAL INTERESTS

I am an avid ping-pong player, especially fascinated by the hand-eye coordination and reflexes involved in playing it. 'When it is ping-pong time, it is me time.'