MORAYO OGUNSINA

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EDUCATION

California State University **Jan 2022 – May 2023**
MSc. Computer Science

University of Southern California **Aug 2020 – May 2021**
MSc. Computer Science (AI Track) (*transferred out*)

Penn State Erie, The Behrend College **Aug 2015 – May 2019**
BSc. Computer Engineering

WORK EXPERIENCE

Cal State LA College of ECST Los Angeles, USA
Graduate Teaching Associate **August 2022 – May 2023**

- Instructed students in Java and Python programming; Offered individual and group tutoring to students. Evaluated students' assignments and proctored tests, and supplemented course materials for topics in introductory computer science.

Microsoft (Azure Mobility Group) Redmond, USA
Software Engineering Intern **June 2022 - Aug 2022**

- Engineered the framework to support a lightweight version of Kubernetes (k3s) for production workloads in the Automotive Edge Platform of the Azure Mobility Team. Streamlined codebase using CI/CD pipeline structures. Technologies & Tools used: C and C++, WSL, VALGRIND, MAKE, Azure DevOps, BOOST, CodeFlow.

Microsoft Research (Sound and Acoustics Group) Redmond, USA
Research Intern - advised by Dr. Dimitra Emmanouilidou **June 2019 - Sept 2019**

- Research objective was centered on AI applications as an aid to understanding the auditory world. The project is a collaborative effort between my group and other departments within Microsoft. At this time, I cannot specify the details of my role in the project due to confidentiality reasons.

Sam and Irene Black School of Business, Penn State Behrend Erie, PA
Software Engineer/Android Developer Intern **June 2018 - May 2019**

- Designed and developed a full-functioning app for donating and receiving food items using Android Studio. Utilized authentication, database design, and location features libraries, including Firebase and Google Places; Adapted UI/UX design patterns to enhance visual appeal; Maintained and tracked project codebase with Git.

ROBOTICS and AI PROJECTS

Autonomous Vehicle Control *CARLA, Kinematic Modelling, Lateral Control, Python*
Implemented longitudinal and lateral control of an autonomous vehicle using classic methods such PIDs, feedforward, and Stanley controls to accurately track a predefined path along a racetrack with a given speed profile. project link demo link

Visual Perception Tasks *OpenCV, Python, Deep Learning, Advanced Mathematics*
Created a perception stack for vision tasks such as camera calibration, stereo depth application, and visual odometry for localization, applied to drivable space and lane estimation.

Full Vehicle State Estimator *Numpy, CARLA, Kalman Filter, Localization, Vector Math*
Implemented ES-EKF-based state estimation model to determine the pose of a vehicle along a simulated pathway given a LIDAR scan registration and GNSS readings.

Autonomous Flight with UAVs *MATLAB, Linear Control, Motion Planning*
Implemented linear controller and motion planning model for a 3-D quadrotor; quadrotor model achieved agile manoeuvres and autonomous operations. Attained familiarity with the kinematics and dynamic modelling of 1, 2 and 3-D quad controls. project link

Path Planning + Little Go + Neural Networks *Python, Jupyter notebook*
Implemented maze traversal algorithms (BFS, UCS A*) project link; Achieved 100% wins against random, smart, and q-learning opponent agents and over 80% wins against aggressive agents using reinforcement learning project link; Implemented a classic neural network that classifies the handwritten dataset (MNIST) project link.

Emotion Detection and IoT Applications (EDIA) *MATLAB, Python, OpenCV, RaspberryPi*
*****Configured and programmed a single-board computer + camera to predict emotions in real-time using a deep-learning model analyzing facial expressions from a live video feed.

COMPUTE PROJECTS

Simon Says Game Development in MIPS Assembly,
Developed a fully functional Simon Says game in MIPS Assembly language. Created engaging graphics and gameplay through skillful utilization of I/O operations, arithmetic operations, and precise program flow components. project link

Advanced Digital Logic Design and Testing *VHDL, Xilinx Vivado, FPGA*
Developed advanced skills in digital logic design and testing, including the design and implementation of standard digital circuits like 4:1 Multiplexers, and shift registers, as well as modelling complex logic systems using state diagrams and register block diagrams.

Digital Logic Design for Visual Sound Analyzer *VHDL, Vivado IDE, FPGA*
Designed complex digital logic for a unique audio-visual system using VHDL, on the Digilent Nexys 4 DDR FPGA board. Converted sampled audio signals into visually intuitive image representations, displayed on a VGA screen. project link

Embedded Systems *C, Microcontrollers*
Implemented simple programs to achieve competency in developing software for embedded systems using microcontrollers and C programming.

Operating Systems and IPCs *JAVA, C++, VMWare, PUTTY, SSH,*
Gained proficiency in inter-process communication concepts, including shared memory, pipes, message queues, signals, multithreading, and multiprocessor operations.

Processing-In-Memory Research Paper 2017 Computer Architecture.
Selected as a finalist for the abstract of a written paper titled "Memory Architecture in Processing in Memory Computing" on preliminary work about a new approach to accessing data from computer memory architecture at SWE Local Tampa 2018.

WEB and MOBILE TECHNOLOGY PROJECTS

Computer Network & Security *Metasploit, Packet Tracer, Kali-Linux, Wireshark, Nessus*
Completed projects involving packet tracing, network intrusion and vulnerability testing, firewall, and VPN configuration, and achieved Platinum level in National Cyber League 2022.

Campus WayFinder *Android Studio, Unity3D, Augmented Reality, Git, Java*
Utilized Unity3D engine and AR plugin to implement low-resource indoor navigation stage for wayfinding app. Demo

USC Films, Web App *Node.js JavaScript, Android Studio, Python, Typescript, Azure, JAVA, FLASK*
Built a single-page movie database web app using Angular, Bootstrap, Node.js, and FLASK, and hosted it on a proxy server deployed both to the Google Cloud and Azure platforms. Designed and developed a mobile app using JAVA and Android Studio.

Data Analytics, MIS 345 *SPSS, StatTools, PowerPoint, R, Excel*
Conducted analytics including sentiment analysis on customer reviews of the Amazon Echo Dot, 2nd, and 3rd generation to generate insight on customer behavior and trends, particularly on product color and reviews; positive reviews on the charcoal echo dot tend to drive more purchases.

SKILLS + TOOLS

Python | C/C++ | CUDA | MATLAB | OpenCV | ROS | Vis. Perception | Path Planning | Embedded Systems | SLAM
Autonomous Modeling | Camera Calibration | CARLA | Latex | Computer Vision | UE4/Unity3D |VHDL | Linux

PUBLICATIONS

Asiyanbola, O.A., **Ogunsina, M.A**., Akinwale, A.T. and Odey, J.B., 2021.Toward African Space Autonomy: Developmental Framework and Incorporated Synergies. New Space, 9(1), pp.49-62.

CERTIFICATES/NON-DEGREE PROGRAMS

Introduction To Self-Driving Cars	– U of Toronto. Provided by Coursera
State Estimation and Localization for Self-Driving Cars	– U of Toronto. Provided by Coursera
Visual Perception for Self-Driving Cars	– U of Toronto. Provided by Coursera
Introduction to Concurrent Programming with GPUs	– JHU. Provided by Coursera
Introduction to Parallel Programming with CUDA	– JHU. Provided by Coursera
Embedded Software and Hardware Architecture	– U of Colorado Boulder. Provided by Coursera
Aerial Robotics (Robotics Specialization)	– UPenn. Provided by Coursera
Mathematics For Machine Learning Specialization	– Imperial College, London. Provided by Coursera
Fundamentals of Deep Learning for Computer Vision	– NVIDIA

ADDITIONAL EXPERIENCE AND ACHIEVEMENTS

DAAD Scholarship Recipient for Research Internship @ Fraunhofer IISB	**2021**		
2nd Place, Space Gov. Innovation contest literature "Towards African Space Autonomy"	**2020**		
*2nd Place, Best Oral Presentation in Comp Sci & Engr (Sigma Xi Annual Conf.)	**2019**		
Dean's List Award Penn State Behrend	**2017**	**–**	**2018**
Achievement Award: 31stRobert D. Lynch Student Leadership Conference	**2017**		
President & Treasurer, American Association of University Women (Behrend)	**2017**	**–**	**2019**
Tutor at Chegg (Android Development and Logic Design) 20/25+ ratings	**2016**	**–**	**2018**
Semi-finalist for Africa sub-region in GoGreen 2014 Challenge by Schneider Elec	**2014**		