JESUDARA OMIDOKUN

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Human factors–oriented researcher with 4+ years of experience in computer vision, robotics, and ADAS. Within 4 years, designed simulator-based studies to evaluate driver mental models, workload, and trust in automated driving, improving task efficiency by 35%. Developed a CARLA-based ADAS platform supporting human-centered automation research.

WORK EXPERIENCE

University of Michigan **01/2022 - Present**
Research Assistant – Computer Vision **Dearborn, MI**

- Within 1+ years, developed a robust framework integrating computer vision models with biomechanical tools, advancing human modeling and ergonomics research and achieving 35% greater time efficiency compared to traditional methods.
- In 2022–2024, applied object identification and detection algorithms to quantify object-weight effects on anthropometric measures, reducing manual measurement effort by ~20% across evaluated human models.
- Designed and validated systems integrating computer vision outputs with biomechanical modeling tools, enhancing human-centered analysis and leading to a paper acceptance in IISE Transactions by February 2025.

Hitachi America, Ltd **01/2023 - 05/2023**
R&D Automotive Intern – Connected Automated Vehicle **Farmington Hills, Michigan**

- Within 5 months, designed and trained a CNN-based lane detection model robust to degraded lane markers, improving lane-level detection accuracy by 12% under adverse roadway conditions and increasing real-time performance from 12 FPS to 25 FPS.
- In Spring 2023, integrated lane-level vehicle counting algorithms across 6+ communication protocols (TCP, UDP, HTTP, RTSP, RTMP, MQTT), enabling interoperability across heterogeneous V2X and backend systems.
- In 2023, validated perception algorithms at Mcity, executing 30+ test scenarios to evaluate accuracy, latency, and robustness under real-world traffic and infrastructure conditions.

University of Michigan **08/2021 - 12/2022**
Research Assistant – Robotics **Dearborn, MI**

- In 2021–2022, developed and validated a cost-efficient(~30% cost-reduction market availability) ML-enabled vehicle platform, programming GPU and microcontroller systems for real-time control and data acquisition; outcomes documented in thesis research.
- Within 16 months, created OSCAR, an open-source robotic car architecture for autonomous-systems research; system design, experiments, and results were published as part of a Master’s thesis.

Massachusetts Institute of Technology, Canadian Space Agency, UMES **05/2018 - 08/2018**
Microgravity Research Intern **Princess Anne, MD**

- Designed free fall microgravity experiment involving free body rotation under a time frame of one month and at 30 % low cost to other teams.
- Developed tools to predict spin states of objects using intermediate axis theorem on MATLAB and Autodesk Fusion.

EDUCATION

Master of Science Industrial & Manufacture Systems Engineering
University of Michigan – Dearborn Dearborn, MI • 05/2027

(Expected: May 2027)

Master of Science in Electrical Engineering
University of Michigan – Dearborn Dearborn, MI • 12/2023

Bachelor of Science: Engineering Specialization Electrical Engineering
University of Maryland Eastern Shore (UMES) • GPA: 3.8/4.0 Princess Anne, MD • 12/2019

Summa cum laude

CERTIFICATIONS

1Z0-071 Oracle Database SQL

FE Electrical and Computer

PROJECTS

Mental Model Development for ADAS via CARLA-Based Driving Simulator

07/2025 - Present

Toyota and University of Michigan - Dearborn

Human Factors, ADAS, CARLA, Experimental Design

- Built a CARLA-based ADAS simulator to study driver mental model formation in automated driving.
- Implemented 3 automation architectures based on modes of operation (manual, ACC, Stop-and-Go, Hands-Off) to vary authority and transparency.
- Ran controlled studies evaluating effects on trust calibration, mode awareness, and mental model alignmen

Driver Workload Management and Adaptive Assistance Project

08/2025 - 12/2025

Human Factors, Workload Assessment, Human–Automation Interaction

- Developed a workload assessment framework integrating task demand, driving context, and automation state.
- Evaluated adaptive alerts and information pacing during automation transitions to reduce cognitive workload and attentional overload.
- Grounded analysis in mental workload, vigilance, and human–automation coordination models.

Federated Learning for Autonomous & IoT Systems

- Designed a privacy-preserving federated learning architecture enabling distributed model training without centralized data sharing.
- Implemented GPU-optimized training pipelines supporting real-time inference on edge devices.

Human-Exoskeleton Interaction via Computer Vision

- Built a computer vision model to identify human movement patterns for optimizing exoskeleton performance.
- Integrated machine learning pipelines with real-time anthropometric data processing.

PUBLICATIONS

Leveraging Digital Perceptual Technologies for Analysis of Human Biomechanical Processes: A Contactless Approach for Workload Assessment

02/2025

IISE Transactions on Occupational Ergonomics and Human Factors

doi.org/10.1080/24725838.2025.2469076

Biomechanical Assessment of Exoskeleton Intervention for Injured and Recovering Workers: A Simulation Study of Bending Tasks

08/2024

Proceedings of the Human Factors and Ergonomics Society Annual Meeting

doi.org/10.1177/10711813241260302

Design and Implementation of an Autonomous Driving System with a Deep Learning Approach on a Scaled Vehicle Platform

12/2022

Deep Blue

dx.doi.org/10.7302/6650

Plasma generation by household microwave oven for surface modification and other emerging applications

10/2020

American Association of Physics Teachers

doi: 10.1119/10.0002706

SKILLS

- **Programming Languages:** C, C++, MATLAB, Python, R
- **AI/ML Frameworks:** Keras, PyTorch, TensorFlow
- **Specialized Skills:** AI Agents, Computer Vision, Convolutional Neural Networks, LLMs, Reinforcement Learning
- **Tools & Platforms:** AWS, Docker, FPGA (VHDL, Verilog), Linux (Ubuntu), ROS, ROS2, VS Code