

TIMOTHY K. UKWUEZE

Robotics and Spatial Computing Engineer

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[LinkedIn](#) | [Portfolio](#) | [YouTube](#)

RESEARCH PROFILE

Robotics and Spatial Computing Engineer with applied research and development experience in autonomous systems, digital twins and immersive technologies. Combines robot modelling, sensor integration, iterative hardware prototyping and VR development. Research interests include robot simulation and validation, perception and autonomy, simulation-to-real transfer, and immersive environments for technical learning.

EDUCATION

B.Eng in Agricultural and Bioresources Engineering

[University of Nigeria, Nsukka](#) | 2014-2019

Focus areas: Farm power, machinery, forestry and mechatronics.

PEER-REVIEWED PUBLICATION

Ukwueze, T. K., Nwafor, S. C., Ugwueze, K. O., Nnadozie, E. C., Odo, M., Ezechi, U., Chukwuma, C. K., Okafor, K., & Ani, A. O. (2024). Design and implementation of an unmanned aerial vehicle (UAV) for image capture in enterprise farming. *Nigerian Journal of Technology*, 43(1), 150-158. [doi:10.4314/njt.v43i1.17](https://doi.org/10.4314/njt.v43i1.17)

Conducted the majority of the original UAV research and development for a final-year undergraduate project, subsequently refined with co-authors for publication.

RESEARCH AND TECHNICAL EXPERIENCE

Head of Robotics & Simulation Labs

[Innov8 Tech Hub](#), Abuja, Nigeria | Feb 2024 - Jul 2026

Led robotics and simulation research and development, including service-robot digital twins, autonomous-drone and AI-manipulation projects. Established the Robotics lab and led SkillForge VR, combining technical direction, prototyping and mentoring.

Head of Simulation Lab

[Innov8 Tech Hub](#), Abuja, Nigeria | Feb 2023 - Feb 2024

Established the Simulation lab and led product visualisation, VR development and robot-simulation workflows. Developed interactive showcases and a nurse-training application, supporting practical experimentation and technical learning.

Product Design Lead

[Innov8 Tech Hub](#), Abuja, Nigeria | Mar 2021 - Feb 2024

Established the Product Design lab and led design, prototyping and fabrication for accelerator ventures. Led projects including an agricultural drone, a ROS 2 mobile robot learning kit and a rice-disease detection platform.

Intern — Instrumentation Division

[National Space Research and Development Agency, Nigeria](#) | Apr - Dec 2018

Worked on engineering design, additive manufacturing and robotics research and development in the Instrumentation Division. Used 3D printing to prototype research components and designed and built a robotic arm as a capstone project.

SELECTED RESEARCH AND DEVELOPMENT PROJECTS

Innov8 Hub Laboratory Design and Setup

Technical planning / Procurement / Lab operations | [View project](#)

Designed and established Innov8 Hub's Product Design, Simulation and Robotics labs for prototyping, research and training. Translated team workflows into equipment specifications, procurement plans and layouts, creating facilities for fabrication, simulation and robot development.

Zero Service Robot and Digital Twin / [Top 10 Finalist, NVIDIA / LycheeAI Competition \(2025\)](#)

NVIDIA Isaac Sim / ROS 2 / Onshape | [View project](#) | [Code](#)

Built a service-robot model and lab digital twin in Isaac Sim to test behaviour before fabrication. Configured joints, colliders and rigid-body physics; integrated virtual LiDAR, cameras and an IMU with ROS 2. Ran navigation and teleoperation tests in the simulated lab, and demonstrated the work on an NVIDIA Omniverse livestream.

SkillForge VR / [1st Place, IEEE Metaverse Grand Challenge \(2025\)](#)

Unreal Engine 5 / Convai / PCVR | [View project](#) | [Project notes](#)

Led development of a voice-first vocational training prototype, building workshop scenarios, a conversational MetaHuman tutor and gamification in Unreal Engine 5 with Convai. Tested on Meta Quest 3 and used early task-based user trials to explore voice navigation, adaptive guidance and interaction with practical workshop activities.

Afrometry - Industrial Asset Intelligence

Reality capture / Digital twins / VR training | [Website](#) | [Demo video](#)

Developed Afrometry demos for oil-and-gas asset management and training, combining reality-captured environments, digital twins and hyperrealistic VR simulation. Built navigable asset experiences with inspection findings and linked engineering documents to support equipment familiarisation and asset-management reviews.

Virtual Tours and 3D Reconstruction

Reality capture / Virtual Tours / 3D Gaussian Splatting | [Best Quarters](#) | [Tour & reconstruction](#)

Produced Best Quarters virtual tours from capture through authoring and web delivery, alongside Innov8 Hub's published tour. Reconstructed indoor spaces with 3D Gaussian Splatting, comparing image-, Quest- and Insta360-based capture workflows and reconstruction tools for effort, visual fidelity and usability.

Mobile Robot and UAV Hardware Development

ROS 2 / Gazebo / ArduPilot | [Mobile robot](#) | [Agricultural drone](#) | [UAV R&D](#) | [Robot code](#)

Designed and fabricated ReVolt, a ROS 2 mobile robot with LiDAR and camera sensing, using Gazebo and RViz to test navigation. Integrated an ArduPilot-controlled siren payload on a separate agricultural drone. For low-cost UAV R&D, led Arduino/IMU integration, complementary filtering and PID tuning; documented flight-test iterations to improve hover stability and reduce vibration.

Product Animation and Technical Visualisation

Blender / Unreal Engine / Adobe tools | [2023 reel](#) | [2024 reel](#) | [VR showcase](#) | [VR review](#)

Product animations and interactive VR experiences for showcasing concepts and reviewing designs. Combined project coordination and animation production at Innov8 Hub during 2023-2025; VR work included a hand-tracked iFAIR product showcase, a lab-planning walkthrough and a CAD-to-VR review proof of concept with measurement, annotations and collaborative viewing.

RESEARCH AND TECHNICAL SKILLS

Robotics and autonomy: ROS 2 (Robot Operating System), Isaac ROS, navigation, motion planning, ArduPilot, PX4

Simulation and digital twins: Isaac Sim, Omniverse, Gazebo, SIL/HIL, sensor modelling, rigid-body dynamics

Perception and AI: SLAM, sensor fusion, computer vision, real-time mapping

Programming and tools: Python, C++, OpenCV, Docker, Git/GitHub, Linux, Anaconda

Hardware and embedded systems: Jetson, Raspberry Pi, Arduino, PCB design, motor and sensor integration

CAD and fabrication: Onshape, SolidWorks, 3D printing, CNC, prototyping

Spatial computing and XR: Unreal Engine 5, Blender, VR training, 360 capture, 3D Gaussian Splatting

PRODUCT DEVELOPMENT AND MENTORING

Product Manager, iFAIR

[Israel-Nigeria Innovation Fellowship, Nigeria](#) | Feb 2022 - Jul 2026

- Defined product requirements, coordinated prototype development and managed delivery for ventures across three cohorts of the six-month iFAIR fellowship.
- Contributed directly to development and mentored founders in health, agriculture, energy and education, guiding concepts toward investment-ready prototypes.

TALKS AND DEMONSTRATIONS

2026 | [The Role of Simulation in Robotics](#). Speaker, inaugural ROS Naija Meetup, Abuja.

2025 | [Service-robot digital-twin demonstration](#). Invited participant, NVIDIA Omniverse livestream.

COMMUNITY LEADERSHIP

Executive Member, ROS Naija: Support Nigeria's Robot Operating System (ROS) community through event organisation and technical knowledge-sharing. Hosted the [first ROS meetup in Abuja](#), Nigeria's capital, at Innov8 Hub, bringing developers, researchers and robotics practitioners together.

AWARDS AND RECOGNITIONS

2026 | [ROSCon Diversity Scholar](#)

2025 | [First Place, IEEE Metaverse Grand Challenge for Simulation-Based Learning](#)

2025 | [Top 10 Finalist, NVIDIA / LycheeAI Robotics Simulation Competition](#)

2024, 2025 | Employee of the Year, Innov8 Hub

2023 | Most Innovative Staff, Innov8 Hub

2019 | Best Undergraduate Project, Agricultural and Bioresources Engineering, University of Nigeria, Nsukka