

# Oyindamola Omotuyi

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## EDUCATION

### Ph.D. in Mechanical Engineering

University of Cincinnati, Ohio

**Research Focus:** Reinforcement Learning, Controls, State Estimation, AI, and Computer Vision

**2018 - 2023 (Expected)**

**MSc. (Graduated 2021)**

GPA 3.9/4.0

### Bachelor of Science in Systems Engineering

University of Lagos, Nigeria

**Senior Design Project:** Design and Fabrication of an Unmanned Aerial Quadcopter System

**Award:** Valedictorian, Overall Best Graduating Student in the University

**2011 – 2016**

GPA 5.0/5.0

## SKILLS

<b>Programming</b>	Python, C++, Pytorch, TensorFlow, Sklearn, Keras, OpenCV, MATLAB, C#, ReactJS, HTML, CSS
<b>Software/Libraries</b>	NVIDIA Isaac Sim, Isaac Gym, Open AI Gym, ROS, Gazebo, RVIZ, APM Autopilot, DroneKit, Visual Studio, PCL, Eclipse, Autodesk Inventor, Autodesk Maya, Mathematica, LaTeX
<b>Hardware/OS</b>	Linux, NVIDIA Jetson Nano, Raspberry Pi, Arduino Uno, Odroid, Intel Realsense D435i, Adafruit IMU Sensors, Wheel Encoders, Pixhawk
<b>Version Control</b>	Git, Bitbucket

## PUBLICATIONS AND PRESENTATION

### CONFERENCE PUBLICATIONS

**Omotuyi, O., & Kumar, M. (2022).** *Learning Decentralized Controllers for Segregation of Heterogeneous Robot Swarms with Graph Neural Networks*. In the International Conference on Manipulation, Automation, and Robotics at Small Scales (MARSS), Toronto, Canada.

**Omotuyi, O., & Kumar, M. (2021).** *UAV Visual-Inertial Dynamics (VI-D) Odometry using Unscented Kalman Filter*. *IFAC-PapersOnLine*, 54(20), 814-819.

**Omotuyi, O., Pokhrel, S., & Sharma, R. (2021).** *Distributed quadrotor uav tracking using a team of unmanned ground vehicles*. In *AIAA Scitech 2021 Forum* (p. 0266).

Ayomoh, M. K., **Omotuyi, O. A.**, Roux, A. J., & Olufayo, O. A. (2018). *Robot navigation model in a multi-target domain amidst static and dynamic obstacles*. In *Proceedings of the IASTED International Conference Intelligent Systems and Control (ISC 2018)* (pp. 44-51).

### POSTER

**Omotuyi, O., Kumar, R., & Kumar, M.** “Real-Time Automated Vehicle Crash Detection and Reporting System”. 21st Annual Pilot Research Project Symposium

Kumat, A., **Omotuyi, O.**, Deshpande, A. M., Calabrese, N., Kumar, M., “Autonomous Mobile Robot Localization and Navigation system using camera and inertial measurement unit (IMU) in an indoor environment”. 2019 AIAA Intelligent Systems Workshop, July 2019.

### PRESENTATION

**Oyindamola Omotuyi**, James Wells, Aditya M. Deshpande, Rumi Kumar, Manish Kumar. “Laser-Based EKF Localization on TurtleBot3 Robot.” 44th Dayton-Cincinnati Aerospace Sciences Symposium. March 2019.

## RESEARCH AND ACADEMIC PROJECTS

- University of Cincinnati Research Council grant project on Indoor Telehealth Drone.
- AprilTag Based-SLAM with known and unknown correspondences on Turtlebot3 mobile robot using ROS/Gazebo.
- Classification of Traffic Light Signals, MNIST, and Fashion-MNIST dataset using Computer Vision Techniques.
- Cooperative Push by Swarm of Ground Robots using an Emergent Local Communication Strategy.
- Attitude Control of a Quadrotor using Linear-quadratic regulator(LQR) and PID Controller.
- Autonomous Waypoint Navigation Path-Following of the StratoSurfer fixed-wing UAV.

## RELEVANT WORK AND RESEARCH EXPERIENCE

- Digital Futures Fellow, Dept. of Mechanical Engineering, University of Cincinnati** **Aug. 2022 - Present**
- Developing human digital twin based on motion modeling for industry applications.
  - Collaborating with other fellows and industry partners in developing state-of-the-art algorithms for industry 4.0/5.0 revolution projects.
- Product Marketing Manager Intern, Robotics, NVIDIA Corporation** **May 2022 - July 2022**
- Developed complex deep reinforcement learning environments for autonomous mobile robots and UAVs using NVIDIA Isaac Gym integration with the NVIDIA Isaac Sim 2022.1 June release.
  - Authored several blogs featured in Mateusz Weekly Robotics newsletter, ROS News for the Week, NVIDIA at ICRA with over 38,000 impressions and 400 likes, etc.
- Graduate Research Assistant, Dept. of Mechanical Engineering, University of Cincinnati** **Aug. 2021 - April 2022**
- Designed the hardware and software stack for keyboard control and obstacle avoidance of an indoor remotely semi-piloted unmanned aerial vehicle for medical supplies delivery and patient communication.
  - Developed robust vehicular crash detection and reporting systems using CNN based on video and audio inputs.
- AI Marketing Engineer Intern, NVIDIA Corporation** **May 2021 - Aug. 2021**
- Authored the first **NVIDIA Conversational AI eBook**, an highly educational resource for business decision-makers and software developers at the enterprise.
  - Collaborated with cross-functional teams to develop marketing assets for NVIDIA Isaac Gym.
  - Contributed to the research paper "Isaac gym: High performance gpu-based physics simulation for robot learning"
- Graduate Teaching Assistant, Dept. of Mechanical Engineering, University of Cincinnati** **Sept. 2018 - April 2021**
- Pioneered with a team the design of a new course curriculum and design projects on Intelligent Mobile Robotics.
  - Supervised students on projects utilizing EKF-SLAM with AprilTags Landmarks on Turtlebot3 in ROS/Gazebo.
  - Tutored 12 students on building and controlling the NVIDIA Jetson Nano Robots.
  - Prepared lecture materials and taught ROS and Gazebo.
  - Content Management for Mechanical Engineering department's First Graduate Program brochure and Webpage.
- Undergraduate Research Assistant, Robotics Lab, University of Lagos, Nigeria** **Feb. 2016 - Oct. 2016**
- Supervised a team of robotics projects such as obstacle avoidance robot car and home automation systems.
  - Built with a team a remote-piloted quadcopter for the University of Lagos Graduation exhibition honored by Lagos state, Nigeria Governor.
- IT Onsite Support Analyst Intern, Schlumberger Nigeria Limited, Lagos, Nigeria** **Jun. 2015 - Jan. 2016**
- Improved users IT support experiences while managing the operations of one of the major locations in Lagos.
  - Reduced the risk of total shutdown due to a widespread fault of networking and server systems.
  - Initiated the development of the first Information Technology unit intern handbook.

## HONORS AND AWARDS

- |   |              |
|---|--------------|
| • <b>1st Place, NVIDIA Riva (Speech AI) Intern Hackathon</b>                                      | 2021         |
| • <b>Graduate Student Engineer of the Month, CEAS, University of Cincinnati</b>                   | 2020         |
| • <b>People's Choice Poster Presentation Award, 2020 Pilot Research Project Symposium</b>         | 2020         |
| • <b>Pilot Research Project Award, University of Cincinnati's Education and Research Center</b>   | 2020         |
| • <b>University Graduate Scholarship, University of Cincinnati</b>                                | 2018-Present |
| • <b>EducationUSA Opportunity Fund Scholar, EducationUSA Lagos Nigeria</b>                        | 2018         |
| • <b>First Nigerian Engineering Graduate with a perfect GPA of 5.00/5.0, University of Lagos</b>  | 2016         |
| • <b>Award of Academic Excellence, The Association of Professional Women Engineers of Nigeria</b> | 2016         |

## LEADERSHIP AND VOLUNTEERING EXPERIENCE

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|---|-----------|
| • <b>Secretary, Mechanical and Materials Engineering Graduate Student Association</b>   | 2020-2021 |
| • <b>Mechanical Engineering Rep, Prospective Graduate Student Orientation, University of Cincinnati</b>   | 2020      |
| • <b>Graduate Student Life Panel Member, Mechanical Engineering, University of Cincinnati</b>   | 2019      |
| • <b>Nigerian Corper's Peer Educator Trainer, NYSC Community Development Service</b>  | 2017-2018 |
| • <b>UNILAG Lean In Circle, organized and participated in meet-ups for ladies in STEM and Web Development Hackathon with mentors from Andela Company.</b> | 2015-2018 |

## PROFESSIONAL AFFILIATIONS

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|------------|--|------------------|
| 2020       | Reviewer, <b>AIAA Science, and Technology Forum and Exposition</b> | Cincinnati, Ohio |
| 2020 - Now | Student Member, <b>UC-IEEE</b>                                     | Cincinnati, Ohio |
| 2018 - Now | Student Member, <b>National Society of Black Engineers</b>         | Cincinnati, Ohio |
| 2017 - Now | Member, Mentor & Alumni, <b>EducationUSA Advising Center</b>       | Lagos, Nigeria   |