

# Nnamdi Chinomso Chikere

South Bend, Indiana | [nnchikere@nd.edu](mailto:nnchikere@nd.edu) | (574) 314-7784 | [linkedin.com/in/nnamdi-chikere](https://www.linkedin.com/in/nnamdi-chikere) | Portfolio

## SUMMARY

Ph.D. researcher in Electrical Engineering specializing in control systems, dynamic system modeling, and robotic systems. Experienced in developing, debugging, and experimentally validating motion-control, calibration, estimation, and adaptive-control algorithms for complex electromechanical systems. Hands-on background in embedded systems, sensing and actuation, hardware-software integration, and data-driven system analysis, with experience translating models and experimental data into improved performance on real robotic and safety-critical hardware.

## EDUCATION

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| <b>University of Notre Dame</b><br><i>Ph.D., Electrical Engineering (Advisor: Prof. Yasemin Özkan-Aydın)</i>                   | Notre Dame, IN<br><i>Expected Jan 2027</i> |
| <b>University of Notre Dame</b><br><i>M.S., Electrical Engineering</i>                                                         | Notre Dame, IN<br><i>Jan 2024</i>          |
| <b>Michael Okpara University of Agriculture</b><br><i>B.Engr., Electrical and Electronics Engineering — First Class Honors</i> | Umudike, Nigeria<br><i>Dec 2021</i>        |

## TECHNICAL SKILLS

**Control Systems:** PID tuning, nonlinear control, adaptive control, RL-based controllers, state estimation, modeling & simulation  
**Programming & Tools:** Python, MATLAB/Simulink, c++, ROS/ROS2, LabVIEW, TensorFlow, PyTorch  
**Embedded Systems:** Motor control, ADC/I2C/SPI, sensor fusion, Raspberry Pi, Arduino, real-time data acquisition  
**Hardware & Design:** PCB design (KiCad), wiring harnesses, electromechanical integration, oscilloscopes, power sensors  
**Simulation & Robotics:** MuJoCo, Isaac Sim, Gazebo, motion planning, kinematics/dynamics, system identification  
**Mechanical Integration:** SolidWorks, 3D printing, rapid prototyping, basic machining

## EXPERIENCE

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| <b>Systems Analysis Intern – Robotics &amp; Controls</b><br><i>Intuitive Surgical</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | May 2026 – Aug 2026<br><i>Sunnyvale, CA</i> |
| <ul style="list-style-type: none"><li>Investigated motion-control performance of safety-critical robotic actuation systems, using system-level testing and data analysis to identify performance gaps associated with electromechanical components.</li><li>Developed and evaluated alternative calibration methods for motor-control systems, comparing model-based and data-driven approaches through repeatability studies, controlled experiments, and quantitative performance metrics.</li><li>Performed root-cause analysis across controls, sensing, mechanics, and calibration software to distinguish hardware variability from algorithmic and measurement effects, informing engineering decisions on component qualification and control-system robustness.</li><li>Built MATLAB-based analysis and test workflows to automate calibration studies, characterize system behavior across operating conditions, and communicate findings and recommendations to controls, systems, and hardware engineering teams.</li></ul>                                                     |                                             |
| <b>Graduate Research Assistant – Robotics &amp; Control</b><br><i>University of Notre Dame – MINIRO Laboratory</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Aug 2022 – Present<br><i>Notre Dame, IN</i> |
| <ul style="list-style-type: none"><li>Designed, implemented, and tuned closed-loop controllers (PID, nonlinear CPG-based oscillators, RL-based controllers) for multi-degree-of-freedom robotic systems, improving tracking accuracy and disturbance rejection across diverse gaits.</li><li>Developed PCBs and sensor fusion pipelines integrating IMUs, force sensors, and current sensors for real-time state estimation and feedback control, enabling stable operation on unstructured terrains.</li><li>Modeled and simulated robot dynamics using MATLAB/Simulink and MuJoCo to evaluate control strategies before deployment, then validated and iterated models through targeted hardware experiments.</li><li>Performed controller debugging and stability testing using oscilloscopes, multimeters, and system diagnostics to isolate issues in electro-mechanical subsystems.</li><li>Implemented embedded control architectures for actuation and sensing using Raspberry Pi and microcontrollers, supporting distributed electro-mechanical setups for experiments.</li></ul> |                                             |

## Graduate Teaching Assistant – Autonomous Mobile Robots

Aug 2022 – May 2023

*University of Notre Dame, Department of Electrical Engineering*

*Notre Dame, IN*

- Guided students through robotics and control labs involving motor control, PID tuning, and embedded feedback systems, reinforcing fundamentals of motion control and system bring-up.
- Mentored projects involving localization, navigation, and real-time control using ROS and Gazebo, emphasizing simulation-to-hardware transfer of algorithms.

## Engineering Intern – Subsea Control & Diagnostics

Aug 2019 – Jan 2020

*Expro International Group*

*Port Harcourt, Nigeria*

- Assisted in calibration and testing of control systems for safety-critical subsea equipment, contributing to reliable operation under high-pressure conditions.
- Performed diagnostics, NDT testing, and fault identification for electromechanical systems under high-load conditions, supporting rapid root-cause analysis and maintenance decisions.

## SELECTED PROJECTS

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### **Amphibious Sea Turtle Robot** | *Control Systems, Embedded Control, PCB Design*

- Designed the control pipeline for flipper coordination using CPG-based oscillators with real-time feedback from IMU and force sensors, increasing trajectory stability on granular and aquatic terrains.
- Developed embedded controllers for synchronized actuation, motor command shaping, and adaptive gait tuning, enabling reliable transitions between land and water locomotion modes.

### **Quadruped Tail-Based Stabilization** | *Nonlinear Control, RL, Mechanical Integration*

- Implemented control strategies for whole-body stabilization using tail-generated torques to reduce body drift during locomotion, demonstrating improved balance during rapid maneuvers.

### **Flagellated Microswimmer Robot** | *Low-Reynolds Control, PCB Design*

- Modeled oscillatory actuation and viscous drag interactions and designed the electrical control system for periodic actuation, achieving controllable propulsion at low Reynolds numbers.

## SELECTED PUBLICATIONS

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**Robust Maneuverability in Flipper-Based Systems Across Complex Terrains**, Bioinspiration & Biomimetics, 2025.

**Embodied Design for Enhanced Flipper-Based Locomotion**, Nature Scientific Reports, 2025.

**Harnessing Flagella Dynamics for Enhanced Robot Locomotion**, IEEE RA-L, 2024.

## LEADERSHIP & SERVICE

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### **Graduate IEEE Coordinator – Expanding Your Horizons**

Apr 2023 – Present

*University of Notre Dame*

- Organized robotics workshops introducing students to control systems, embedded programming, and electromechanical design, broadening participation in STEM.

### **Coach – Marmon Innovate-a-thon Challenge**

2023 – Present

*Marmon Holdings Innovation Program*

- Mentored undergraduate teams solving real engineering problems with design, testing, and analysis workflows, emphasizing iterative experimentation and data-driven decisions.

### **STEM Outreach – Indiana Robotics State Championship**

Mar 2025

*Indiana, USA*

- Supported hardware and control evaluations during judging of student-built robots, giving feedback on system integration and control performance.