Nitish Patil

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Curriculum Vitae

Education

PhD, Electrical & Computer Engineering **Expected Graduation Date: Summer 2027**
Mississippi State University, Starkville, MS August 2022 – Present
Dissertation: From Dynamic Partitioning to 3D Localization: Adaptive Edge-Server Vision for Safety-Critical Systems
Advisor: Dr. Yu Luo
GPA: 3.87/4.00

Master of Computer Applications, University of Pune **July 2016 – May 2019**

Bachelor of Computer Applications, University of Pune **June 2013 – May 2016**

Research Interests

Edge computing, edge AI, collaborative edge-server inference, computer vision with 3D perception, autonomous robotic systems, embedded systems, Internet of Things (IoT).

Research Experience

PhD Researcher – Electrical & Computer Engineering | Mississippi State University **August 2022 – Present**

Environment-Aware Dynamic Partitioning (EADP)

- Developed a neural-network partitioning framework that selects edge-server execution strategies using profiled system costs under changing compute and network conditions.
- Implemented and evaluated partitioned YOLO inference on NVIDIA Jetson platforms, achieving up to 2.06× the baseline FPS on Jetson Orin Nano under thermal and network variability.
- Trained and evaluated multiple quantized YOLO models to compare against FP32 baselines on NVIDIA Jetson platforms.

Edge-Assisted Multi-Camera 3D Perception

- Developing a low-latency multi-camera system that uses 2D detections and camera geometry to estimate 3D position, dimensions, and orientation for situational awareness and safety monitoring.

Fully Onboard Robotic Perception and Language-Based Planning

- Developed an autonomous Unitree Go1 quadruped robot perception and planning stack using Jetson Orin Nano, running YOLO vision with a local Llama 3.2 model that converts natural language into high-level robot actions.
- Evaluated perception FPS and LLM planning latency across model sizes and TensorRT precision modes to identify real-time operating limits.

Teaching Experience

Independent Instructor (Appointed) – ECE 3724 Microprocessors (Core ECE Course) ≈ 55 Students **Spring 2027**

Training Program Developer & Instructor – ConstructionCI – 19 Students | Mississippi State University **2025 – 2026**

- Developed and taught lectures in Digital Electronics, C Programming, Microcontrollers, Edge AI, Computer Vision, Cybersecurity, and Robotics.
- Created hands-on labs in computer architecture, microcontrollers, NVIDIA Jetson Orin Nano, computer vision, AI training for concrete crack classification, AI-controlled robotics, and LLMs for scene recognition.

Teaching Assistant | Mississippi State University **2023 – 2026**

• ECE 6743 – Digital System Design	Fall 2024, Spring 2025, Fall 2025, Spring 2026	**62 Students**
• ECE 6723 – Embedded Systems	Fall 2024, Spring 2025, Fall 2025	**70 Students**
• ECE 3724 – Microprocessors	Spring 2024, Spring 2026	**56 Students**
• ECE 3313 – Electromagnetics	Fall 2023	**52 Students**

Student Mentoring

Technical Mentor – 4 Students | Autonomous Robodog Capstone Project **2026 – Present**

- Advising a University of Alabama senior capstone team develop an autonomous quadruped robotic system.
- Focus: Robotics, Embedded Computing, Perception, Application Development and System Integration.

Graduate Research Mentor – Summer REU Programs – 4 Students | Mississippi State University Summers 2024 – 2026

- Mentored undergraduate researchers on embedded AI, computer vision, and autonomous robotics projects, including implementation, experimentation, benchmarking, and data analysis.

Teaching Mentor – Construction Cyberinfrastructure – 1 Student | Mississippi State University **Summer 2026**

- Prepared undergraduate TA for C programming, electronics, microprocessors, edge devices, and machine learning.

Leadership & Professional Development

Preparing Future Faculty (PFF) Program | Mississippi State University **August 2026 – Present**

- Participant in a faculty-development program covering teaching, academic career preparation, research communication, and faculty responsibilities.

Software Lead – Xipiter UAS | Mississippi State University **August 2022 – August 2024**

- Developed a ROS 2 autonomous fixed-wing aircraft stack integrating software, controls, airframe, actuators, and avionics.
- Trained and deployed YOLOv8 on Jetson Xavier for onboard detection, localization and autonomous payload delivery.

Industry Experience

Director (Embedded Systems Division) | Aerience Air Science & Contamination Control Pvt. Ltd. April 2019 – August 2021

- Developed a portable duct leakage tester using a NOVENCO ZerAx AZL fan integrated with VFD, Raspberry Pi, wireless pressure sensors and Qt software.
- Developed multiple embedded sensing solutions for the HVAC industry using Raspberry Pis, PLCs, and LoRa devices.

Technical Skills:

Programming: Python, C, C++, Embedded C, MATLAB, SystemVerilog, Assembly.
Machine Learning & Vision: PyTorch, TensorFlow, TensorRT, YOLO, computer vision, quantization.
Robotics & Embedded Systems: ROS 2, NVIDIA Jetson (Xavier, Orin, Nano), Raspberry Pi, ESP32, Arduino, FPGAs, PLCs.
Tools: Linux, Git, AWS, Vivado, MPLAB, Qt Framework.

Publications & Manuscripts

1. **N. Patil**, P. Loux, Y. Luo, R. U. Farooqui, and S. U. Khan, "Cyberinfrastructure Training Modules for Construction Management Education: Findings from the First Cohort," presented at the 2026 ASEE Midwest Section Conference, Norman, Oklahoma, Sept. 2026.
2. **N. Patil**, P. Loux, L. Li, Y. Luo, and L. Pu, "Environment-aware Dynamic Partitioning of Neural Networks," under review at the Journal of Network and Computer Applications, 2026.