Amey Gavale

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EXPERIENCES

NextGen Embodied AI Solutions Lab, UIUC   *Champaign, USA*
Research Assistant (Robotics Software Engineer)   **Jan 2025 - Current**
- Designed and simulated the digital twin **autonomous docking algorithm** for BlueBoat **USV** in **Gazebo** prior to ROS2 deployment, **reducing integration time by 20%.**
- Integrated LiDAR point cloud processing, **stereo vision**, and **sensor fusion** with **PID control**, **achieving 90% docking success rate** in trials. Research and Development of **perception & navigation stack** for Amiga agriculture robot, improving phenotyping **accuracy by 30%** & **navigation speed by 25%** through **stereo depth mapping**

GE Aerospace Research   *Champaign, USA*
Research Collaboration   **May 2024 - Oct 2024**
- Benchmarked different **SLAM** frameworks using EuRoC and Kagaru datasets, improving **localization robustness by 8%** through parameter tuning. Analyzed SLAM pipeline failures due to image brightness/contrast variations.

Accenture Solutions   *Pune, India*
Application Development Associate   **Feb 2022 – May 2023**
- Developed ERP automation solutions using PeopleCode, PIA, and Application Engine, reducing invoice processing time by 30% and manual errors by 40%.

SKILLS

Programming: Python, C++, Docker, MATLAB, PyTorch, TensorFlow, ROS2, gRPC, SQL, Git, Linux, Docker, CUDA
Software: SLAM, Tableau, Sensor Fusion, Computer Vision (CNNs, YOLO, Pose Estimation, Depth Mapping), CAD
Hardware: LiDAR, Stereo Vision, GNSS, IMU, UR3, Raspberry Pi (GPIO, I2C, SPI), Jetson

EDUCATION

University of Illinois at Urbana-Champaign   *Champaign, USA*
Master of Engineering in Autonomy & Robotics   **Aug 2023 – May 2025**
Coursework: *Introduction to Robotics, Mobile Robotics, Computer Vision, Autonomous Vehicle Systems*

College of Engineering Pune   *Pune, India*
Post Graduate Diploma in Data Science and Artificial Intelligence   **Aug 2021 – Aug 2022**
Coursework: *Machine Learning, Natural Language Processing, Deep Learning, DBMS, Statistics and Linear Algebra*

Pune University   *Pune, India*
Bachelor of Engineering in Mechanical Engineering   **Aug 2017 - Apr 2021**
Coursework: *Fundamentals of Programming Languages, Mechatronics, Robotics, Hydraulics and Pneumatics, CAD*

PROJECTS

Classifying Distracted Driving Behavior using CNN and Pose Estimation   *Aug 2024 - Dec 2024*
- Engineered and deployed a **Convolutional Neural Network (CNN)** achieving **97% accuracy** on grayscale images and **99.9% accuracy** for **detecting distracted driving events** using the State Farm Distracted Driver Dataset.
- Benchmarked CNN against **pose estimation**-based models, demonstrating **15-20%** higher **accuracy** and faster inference times, optimizing real-time driver monitoring systems.

Gem e4 Autonomous Vehicle Development (Lane Adherence & Control)   *Aug 2023 - May 2024*
- Designed and fine-tuned **MPC** for smoother trajectory tracking, reducing lateral deviation by **up to 0.15 meters** and **minimizing jerk by 18%.** Integrated **Pedestrian Detection**, **Lane Following**, and **Object Detection** algorithms, achieving **80% detection accuracy** in dynamic urban driving scenarios. Developed navigation stack with **LiDAR-based spatial mapping** for confined-space maneuvering, enabling **>90% obstacle avoidance** success rate.

Robo Sorter   *Aug 2023 - Dec 2023*
- Built a **vision-based robotic sorting system** using camera sensors and **inverse-kinematics**, successfully sorting **7 distinct colored packages within 60 seconds**.