Amey Gavale

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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, Principles of Safe Autonomy, Smart Cities-Homes & Beyond, Human Centered Autonomy, Remote Sensing*

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*

EXPERIENCES

NextGen Embodied AI Solutions Lab, UIUC — *Champaign, USA*
Research Assistant — **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** & **gRPC** based control.

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, resulting in improved **feature tracking** stability.

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

Mechanical & Manufacturing: CAD (SolidWorks, Catia), Ansys, CNC
Software: , Python, C++, MATLAB, ROS, SLAM, Tableau, Sensor Fusion, Computer Vision
Hardware: LiDAR, Stereo Vision, GNSS, IMU, UR3, Raspberry Pi (GPIO, I2C, SPI), Jetson

PROJECTS

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**. Designed scalable architecture to incorporate **barcode recognition and autonomous mobile base integration**, targeting a **30% throughput increase** in future iterations.

Design and Analysis of VTOL UAV — *Aug 2020 - May 2021*

- Built gain-scheduled cascaded **PID** for **hybrid VTOL UAV** (hover/transition/cruise) with waypoint guidance + safety interlocks in **MATLAB/Simulink & ROS2**, delivering stable autonomous transitions.