Nandagopal Vidhu | Resume

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Education

University of Pennsylvania, ***MSE in Robotics***, *GPA - 3.95/4.0* *2025 – 2027*

- Awarded merit-based scholarship worth $58,000 from JN Tata Endowment Fund and Narotam Sekhsaria Foundation.

IIT Bombay, ***Bachelor's in Mechanical Engineering***, *GPA - 3.93/4.0* *2018 – 2022*

- Bachelor's Thesis Research Award (1 of 11 among 1000+ students) and Narotam Sekhsaria Foundation UG Engg. Scholarship.

Technical Skills

Programming	OOP | C++ (Embedded systems), Python (Data Analysis, ML), JAX, PyTorch, Linux, Git
Planning & Control	PID, LQR, MPC, MPPI, RL | trajectory generation, pure pursuit, RRT, control barrier functions
Robotics	ROS 1/2, NVIDIA Jetson/TensorRT, GNSS-RTK/INS, SLAM, state estimation, sensor fusion
Simulation & Tools	Isaac Sim, MuJoCo, MATLAB/Simulink, CarMaker, CAN/CANalyzer, HIL/SiL/MiL testing, SolidWorks
Coursework	Learning in Robotics, Machine Perception, Embedded Systems, Kinematics & Dynamics, Control Theory

Work Experience

Built Robotics, ***Robotics Engineer Intern*** *June – August 2026*

Autonomous Ground Robot for Solar Site Surveys Philadelphia, US

Two-person project taking a 1/5-scale autonomous vehicle from bare chassis to live deployment, replacing manual rod surveys.

- Built the vehicle end to end - 1/5-scale custom chassis, isolated custom power board, enclosure, $9.6k BOM, sensor calibration.
- Ported Theia, Built's AI personnel-detection system, and modified it for use on the Jetson Orin AGX to enable real-time braking.
- Wrote the ROS 2 Finite State Machine and motion planner in Python/JAX - generating curvature-feasible paths through every survey point, then tracking them with a sampling-based MPPI controller, running real-time at 34 Hz.
- Traced a 3.2 Hz steering oscillation issue to actuator lag; retuned the controller to cut cross-track error from 35 cm to 9 cm.
- Fused RTK-GNSS/INS with a Time-of-Flight sensor: 50 piles surveyed at 1.9 cm mean elevation error, 12x faster than manual.

Jaguar Land Rover TBSI, ***Systems Engineer*** *July 2022 – August 2025*

R&D in Suspension Controls for Chassis Active Systems Bangalore, India

Model-based control research for fully active suspension - vertical-dynamics modelling, controller design, ride-comfort evaluation.

- Derived and validated a linear state-space model of full-vehicle vertical dynamics with four coupled actuators.
- Designed and tuned an MPC controller over that model, improving ISO 2631 weighted ride comfort by more than 30%.
- Developed a novel estimation and control strategy using measured front-axle response as preview for the rear axle.

System-level Development & Validation of Seating Systems

System-level ownership of seat features across the V-cycle - requirements, HIL and bench validation, and test automation.

- Built and commissioned a Hardware-in-the-Loop rig, unblocking on-time validation of Jaguar's 2026-27 lines.
- Authored 2 SAE technical papers and presented at the SIAT 2024 conference to 50+ engineers, suppliers, and researchers.
- Automated test-case validation and requirements tracking, cutting turnaround from hours to minutes; JLR Creator Award.

Research Experience

Learning-to-optimize (L2O) for planning and control of wheeled-legged quadrupeds *2026 – 2027*

Master's thesis with Prof. Rahul Mangharam on learning-based planning and control for wheeled-legged quadrupeds.

- Training RL policies in Isaac Sim/Lab for advanced wheeled-legged locomotion, including stair climbing and rough terrain.
- Deploying these policies on a Deep Robotics M20 wheeled quadruped, and bringing up its control stack with camera and lidar.

RoboRacer (F1/10) Autonomous Racing | Course Project *January – May 2026*

Semester-long project on a 1/10-scale racecar with onboard Jetson, LiDAR and camera, culminating in a head-to-head race.

- 1st place among 17 teams in the final competition; used a pure-pursuit controller w/ adaptive lookahead and obstacle avoidance.
- Built the stack in C++ and Python: SLAM mapping, particle-filter localization, RRT planning and MPC trajectory tracking.
- Developed a vision-based friction-aware controller (MobileNetV3, TensorRT): 17% faster laps, stable where the baseline spun out.

A Computational Model for SLA 3D Printing *2021 – 2022*

- Bachelor's thesis on modelling the SLA 3D printing process - published in PIAM (Springer) Journal and cited 20+ times.