

Shantanu Nitin Ghodgaonkar

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TECHNICAL SKILLS

Programming Languages: Python, C++, C, Java, HTML, CSS, JavaScript, XML
Frameworks & Libraries: PyTorch, ROS Humble, OpenCV, SciPy, Pinocchio, Simulink, MATLAB Robotics Toolbox
Robotics Fundamentals: 3D and Epipolar Geometry, Linear Algebra, Kinematics, Dynamics, Probability, Statistics
Robotics Platforms: Universal Robotics UR16, CoppeliaSim, ROS, Nvidia Jetson Nano, Raspberry Pi, Arduino, ESP32
Control Systems: PID Control, LQR Control, Model Predictive Control, Numerical Optimization
Tools & Others: Git, Subversion, CUDA, Jira, Confluence, LabVIEW, EasyEDA, Overleaf

EDUCATION

New York University, Tandon School of Engineering Sep 2023 - Present
Master of Science in Mechatronics, Robotics and Automation Engineering
Relevant Coursework: Robot Localization & Navigation, Robot Perception, Reinforcement Learning & Optimal Control for Robotics
Visvesvaraya Technological University, Bangalore Institute of Technology Aug 2017 - Aug 2021
Bachelor of Engineering in Electronics and Instrumentation Engineering
Relevant Coursework: Control Systems, Virtual Instrumentation, Digital Image Processing, Neural Networks & Fuzzy Logic Systems

EXPERIENCE

Adjunct Professor | NYU Tandon School of Engineering | NY, USA Jun 2024 - Present
• Instructed the Automatic Control Laboratory (ME-UY 3411), emphasizing PC-based data acquisition, PID control, LQR control, and real-time control systems, for both linear and non-linear systems.
• Guided students in programming a UR16 robotic arm, highlighting path planning and error handling to strengthen practical robotics skills.
• Spearheaded the development of control algorithms for a 7-DOF hexapod robot, leveraging numerical optimization methods to achieve a 20% improvement in stability.
• Optimized the robot's foot design by analyzing mechanical CAD drawings, enhancing traction and load distribution.
• Designed the hexapod's electrical and computing subsystems through the development and validation of electrical schematics prior to manufacturing, ensuring robust system integration.
• Introduced Poke-Yoke principles to enhance reliability and reduce common assembly errors in the electrical design processes.
• Scalable Trajectory Optimization, Motion Planning algorithms developed for the Hexapod can extend to humanoid robots.
• Utilized MuJoCo within CoppeliaSim for comprehensive robot simulations, validating precomputed gait patterns and reducing physical testing time by 30%, upon deployment on the real robot.
• Currently implementing multi-threaded vision and contact rich Model Predictive Control algorithms, improving the robot's interaction with complex environments, using ROS Humble.
• Preparing an Unscented Kalman Filter for robust state estimation under uncertainty, bolstering sensor fusion capabilities.
Software Engineer | Bosch Global Software Technologies | Bengaluru, India Sep 2021 - Jul 2023
• Developed and maintained Java-based Automotive Diagnostic Tools for ODX data processing & automation.
• Built an ANTLR-based A2L parser for Daimler, completing the project 4 months ahead of schedule.
• Led the development of a customized automation tool for INEOS, reducing development time by 70%.
• Created internal software automation tools that sped up ODX error resolution by 40%.
• Verified ODX data and conducted ECU simulation testing using OTX for McLaren.
• Supported the development of HTML, CSS, and JQuery-based screens for GRADE-X, reducing lead time by 10%.
• Authored diagnostic content for Flashing Over-The-Air (FOTA) product prototyping.
• Managed Agile sprints with Jira, maintaining a 90% on-time delivery (OTD) rate.
• Served as a Technical Interviewer and produced a training video library, reducing developer onboarding time by 30%.
Diagnostic Content Engineering Intern | Bosch Global Software Technologies | Bengaluru, India Mar 2021 - Jun 2021
• Developed OTX screens for ECU simulation using HTML, CSS, and JavaScript to support diagnostic workflows.
• Integrated and validated OTX screens for vehicle testing in diagnostic systems.
• Collaborated with cross-functional teams to improve ECU simulation accuracy and streamline workflows.
• Participated in AUTOSAR, UDS and CAN Protocol Training.

PROJECTS

Obstacle-Aware Control of 2D Quadrotor using PPO in Custom Reinforcement Learning Environment | [GitHub](#) Dec 2024
Deep Q-Learning to solve Linear Inverted Pendulum problem using PyTorch | [GitHub](#) Nov 2024
Comparison between Value and Policy Iteration over Grid World | [GitHub](#) Oct 2024
Trajectory Optimization and MPC for a 2D Quadrotor | [GitHub](#) Sep 2024
Hexapod Robot Development | [GitHub](#) Sep 2024 - Present
Maze Solving Robot using Raspberry Pi and Arduino | [GitHub](#) May 2024
Vision and IMU Fusion with Unscented Kalman Filter | [GitHub](#) April 2024