Shantanu Nitin Ghodgaonkar

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Technical Skills

Robotics Fundamentals: 3D and Epipolar Geometry, Linear Algebra, Calculus, Kinematics, Dynamics, Probability

Robotics Software: ROS Humble, CoppeliaSim, MATLAB Robotics Toolbox, Simulink, Pinocchio, SciPy, PyTorch, OpenCV

Programming & Development: Python, C/C++, Java, HTML, CSS, JS, XML, Maven, ANT, Git, Subversion, CUDA

Embedded Systems: Arduino (Uno, Mega), ESP32, ARM Cortex M3, Raspberry Pi, Nvidia Jetson Nano

Design Software: NI LabVIEW, EasyEDA, LPKF CircuitPro, Bosch GRADE-X, DTS Venice

Documentation Software: Jira, Confluence, diagrams.net, C4 Model, MiKTeX, 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*
- Instructing the Automatic Control Laboratory (ME-UY 3411) with a focus on PC-based data acquisition, PID control, LQR Control, and real-time control systems.
- Enhancing student understanding of control theory through hands-on projects on the Quanser Q8-USB H.I.L. control board and Simulink simulations.
- Conducting workshops for high school students on electronics and embedded systems (Arduino Uno), boosting engagement and programming proficiency.
- Spearheading the development of control algorithms for a 7-DOF hexapod robot with 3 motors per leg, focused on motion planning and control using numerical optimization methods.
- Implemented tripod gait using Kinematic Trajectory Optimization with a custom SQP Solver, over the entire robot.
- Utilizing MuJoCo within CoppeliaSim for robot simulation, thus validating precomputed gait patterns.
- Working on the implementation of Contact-Rich Model Predictive Control for dynamic trajectory optimization
- Preparing to develop an Unscented Kalman Filter for state estimation to handle anticipated non-Gaussian uncertainty.

Associate Software Engineer | Bosch Global Software Technologies | Bengaluru, India *Sep 2021 - Jul 2023*
- Developed and maintained Java-based Automotive Diagnostic Tools for ODX data processing.
- 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 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.
- Authored diagnostic content for 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.

Summer Engineering Intern | FluxGen Sustainable Technologies | Bengaluru, India *Jul 2020 – Sep 2020*
- Developed a wireless temperature and humidity monitoring system using the ESP32 Wi-Fi & Bluetooth module.
- Created an Android app to display sensor data in real-time, improving monitoring accessibility.
- Developed a wireless system connecting patients and doctors through an ad-hoc network, improving care during the COVID-19 pandemic.
- Designed wearable devices with ESP32 μC and LoRaWAN (RFM95) for wireless communication.
- Integrated sensors (MCP9808, MAX30102) to track body temperature, heart rate, and SpO2 levels in real-time.
- Implemented a meshed network using the ClusterDuck Protocol for real-time data collection between wearable devices.
- Developed web-based user interface using HTML and JS, for monitoring data from wearable devices.
- Authored SEO/SEM content for the company's website, boosting search visibility and web traffic.
- Published an article on "Smart Water Management" in "Water Today," showcasing sustainable solutions.