

TEJAS M. BHADRE

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Robotics and Mechanical Design engineer with expertise in developing and fabricating product design, and autonomous systems.

Education

Master of Sciences - Mechanical Engineering: Major in Robotics

Expected: Dec 2025

University at Buffalo, The State University of New York, NY

Coursework: Optimisations in Engineering Design, Manufacturing Automation, Control Systems, Computer Vision,

Bachelor of Engineering – Mechanical Engineering

August 2017 - June 2021

University of Mumbai, India

Skills

CAD and FEA: PTC Creo, Solidworks, CATIA, Fusion 360, Siemens NX, ANSYS Fluent, Hyperworks, PTC Windchill

Languages: Python, C++, C#, C, R, MATLAB/Simulink.

Robotics: ROS2, MoveIt2, URDF, Nav2, SLAM, Path planning, ADAS, Gazebo, Foxglove, Kalman Filter, Digital Twin

Computer Vision: OpenCV, 3D Reconstruction, Object Detection, 3D Geometry, Fiducial Estimation

Machine Learning: PyTorch, LLM, Transformers, TensorFlow, CUDA, CNN, OpenAI Gym, Isaac Sim

DevOps: Docker, Linux, Git, AWS

Experience

Student Assistant, DRONES Lab

May 2025 – Present

- Contributed to the Localization, Navigation, and Control stack for an autonomous excavator funded by MOOG Inc., including recording ROS bags for the analysis of Safety Nodes and motion planning algorithms.
- Developed a robust April Tag detection and real-time angle and pose estimation pipeline by leveraging OpenCV and a multi-layer perceptron, efficiently correlating inclinometer readings with ground truth values using deep learning.
- Created a digital twin of an excavator using its URDF model in MoveIt-2 to enable realistic simulation and learning, significantly reducing the need for physical resources and prototype testing.

Design Engineer, Blue Star Ltd. – Mumbai, India

June 2022 – Aug 2024

- Owled end-to-end hardware development by leading the revamp of a Packaged Air Conditioning System from initial concept and 3D CAD modeling through prototyping and into production, achieving a 30% reduction in manufacturing cost.
- Spearheaded mechanical design for fit, finish, and performance by creating detailed part and assembly drawings, applying GD&T, and utilizing FEA simulations to enhance thermal performance and structural integrity of critical components like copper piping.
- Championed Design for Manufacturing (DFM) and Assembly (DFA) by facilitating cross-functional reviews with Electrical, Manufacturing, and Supply Chain teams, optimizing designs for machining, die casting, and assembly to improve producibility and sustainability.
- Validated product performance and reliability through Finite Element Analysis (FEA) for structural integrity, thermal management analysis to boost energy efficiency, and the development of robotic testing fixtures that increased calibration accuracy by 35%.
- Bridged design and physical implementation by creating comprehensive production documentation (GD&T, assembly drawings) and applying hands-on fabrication skills to build and deploy end-of-line testing systems, directly contributing to a 60% reduction in production cycle time.

Mechanical Design Intern, Siddhitech Stainless Co. – Pune, India

January 2022 – June 2022

- Engineered and managed over 50 detailed parts and assemblies for stainless-steel drainage products, ensuring compliance with ANSI Y14.5 GD&T standards and maintaining all drawings on an ERP system to meet customer and manufacturing requirements.
- Designed and fabricated more than five progressive tool die sets for forming operations on SS sheets, utilizing Rapid prototyping, lathe, milling, and drilling machines.
- Created and prototyped Medi-kits using 3D printing for demonstration, leading to the successful manufacture of robust final products.
- Formulated and implemented CNC programs for precision threading cycles, adhering to API 7-1/7-2 standards for downhole tool manufacturing.
- Managed and guided quality inspections - Non-destructive testing in the Machine shop, ensuring 99% on-time delivery of API-standard products.