JYOTISHKA DUTTA GUPTA
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EDUCATION

Master of Science, Robotics (2024 – April 2026, GPA – 3.87 / 4)
University of Michigan, Ann Arbor

Bachelor of Technology, Mechanical Engineering with Minor in Machine Design **(**2019 -2023, GPA – 3.712 / 4)
Manipal Institute of Technology, Karnataka, India

WORK EXPERIENCE

Actuator Development Intern, Tesla - Optimus, Palo Alto, CA — May 2025 – Aug 2025

- Developed mechanical design of geartrains in roller screw based compact linear actuators for humanoid robot limbs using 3DExperience Catia, ANSYS, KISSsoft and Romax.
- Implemented mathematical model of root and contact stress for involute gear teeth from ISO 6336 standards using Python, optimised gear design using high resolution parametric sweep.
- Devised & conducted tests to measure applied preload on angular contact bearings in actuator assemblies using donut type load cells.

Lead Engineer, Robotic Manipulators, Twara Robotics - ARTPARK 🔗 — Jan 2024 – July 2024

- Spearheaded a team of 3 engineers in the development of 6 DOF 3-10 kg payload articulated manipulators & underactuated adaptive two-jaw electromechanical grippers.
- Conducted design analysis & performance benchmarking of UR & IGUS cobots, & grippers (Robotiq, OnRobot).
- Automated a linkage mechanism design pipeline by integrating kinematic models & multibody dynamic simulation with parametric CAD on Solidworks using MATLAB.

Engineer, Robotic Actuators, Twara Robotics – ARTPARK 🔗 — Jan 2023 – Dec 2023

- Developed robot joint actuators with custom strain wave gearboxes and solenoid brakes using KISSsoft & COMSOL.
- Improved gearbox torque & lifecycle by 5x and 30x by devising test methodology and fixtures featuring magnetic hysteresis brakes and torque sensors. Administered 50+ performance and backlash tests, analyzed data & failure modes.
- Patent filed for a novel design of the strain-wave gearing system that is optimized for plastics.

PROJECTS

Researcher, ARCAD Biped Lab, University of Michigan — January 2025 – May 2025

- Development of high torque density & high efficiency rotary actuators for humanoid robot joints featuring Wolfrom - compound planetary gearboxes and frameless BLDC motors using Solidworks and Gearteq.

MITACS Globalink Research Intern, Queen's University, Kingston ON 🔗 — May 2022 – Jul 2022

- Designed 8-legged robot prototype to study gait and biomechanics of asymmetric limb configurations in organisms.

Team Lead, Mars Rover Design Team, Manipal Institute of Technology 🔗 — 2019 – 2022

- Led a 49-member undergraduate team in 7 international robotics competitions & 9 AI/robotics research projects.
- Developed prototype Mars Rover and 6-DOF manipulator with cycloidal gearboxes, using CAD, CAE, FDM, & CNC.

PATENTS & PUBLICATIONS

"Structural Design and Analysis of 6-DOF Cylindrical Robotic Manipulators for Automated Agriculture" In *Precision Agriculture for Sustainability, pp. 147-168. Apple Academic Press* (2024). 🔗

Patent Title: Flexible Spline & Wave Generator for Strain Wave Gearing (202341066798) 🔗 — 2023

Patent Title: Design and Development of Novel Suspension System Based on Five-Bar Mechanism for Off-road and Extra-terrestrial Exploration Vehicles **(**202141051528) 🔗 — 2021

DESIGN PORTFOLIO 🔗 | Scan QR above