




# Sagar Jatin Joshi

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## Education

**University of Southern California, Los Angeles**

**August 2023 – Present**

*Masters of Science in Mechanical Engineering*

*GPA: 3.73/4.0*

Coursework: Manufacturing Automation, Robotics, Mechatronics, Machine Learning, Autonomous CPS, DFMA

**University of Mumbai, India**

**August 2019 – May 2023**

*Bachelor of Science in Mechanical Engineering*

*GPA: 8.7/10.0*

Coursework: Machine Design, Industrial Control, Mechanical Vibrations, Additive Manufacturing, FEA

## Technical Skills

**Programming/Robotics:** Python, C++, MATLAB, Java, Kuka Sunrise.OS, ABB RobotStudio, MoveIt2, tf2, Hand-Eye Calibration, realsense2, NVIDIA CuRobo, CuMotion, Isaac ROS

**Software:** IsaacSim, Webots, Pybullet, ANSYS, Fusion 360, SolidWorks, ABAQUS, Simulink, RoboDK

**Manufacturing:** 3D Printing, CNC Machining, Drilling, Grinding, Manual & Automated Assembly, GD&T

## Experience

**Realization of RObotic Systems Lab (RROS)**

**May 2024 – Present**

*Research Assistant*

*Los Angeles, CA*

- Engineered dual-arm coordination on an ABB IRB120 and KUKA iiwa 14, integrating Nvidia cuMotion library and OMPL for high-efficiency motion planning in battery disassembly workflows
- Incorporated multi-view perception using ROS2 + RealSense data streams to capture 6D poses, employing transformer-based behavior cloning (hand-guiding + imitation learning) for intuitive human-in-the-loop data generation
- Operationalized diffusion-model-based action prediction to handle uncertain object geometry, ensuring robust closed-loop disassembly across varying battery positions and orientations
- Developed a real-time deployment workflow with data-driven trajectories, leveraging a differentiable paradigm for scalable autonomy and large-model testing in real-world robotic systems

**Zhao Research Group**

**September 2023 – January 2024**

*Research Assistant*

*Los Angeles, CA*

- Engineered a soft stretchable EMG sensor with a micro-needle array in a serpentine pattern for improved muscle readings, optimized for UV resin 3D printing, and enhanced adhesion while maintaining flexibility.

**Cosmos Cable Glands**

**June 2021 – August 2021**

*Junior Engineer Intern*

*Mumbai, India*

- Facilitated design, manufacturing, and testing of various types of cable glands, resulting in production of 3 distinct product models applying GD&T to meet predefined manufacturing standards
- Conducted ISO standard tests, attaining a 18% increase in structural durability, while researching optimal material specifications for client-driven cost, properties, and performance criteria

## Publications

- Kang, Jeon Ho, Joshi, Sagar, Huang, Ruopeng, & Gupta, Satyandra K. (2024). "Robotic Compliant Object Prying Using Diffusion Policy Guided by Vision and Force Observations.", IEEE Robotics and Automation Letters.
- Joshi, Sagar Jatin, Mamaniya, Smit, & Shah, Ruchit (2022). "Integration of Intelligent Manufacturing in Smart Factories as part of Industry 4.0-A Review." In *2022 Sardar Patel International Conference on Industry 4.0-Nascent Technologies and Sustainability for 'Make in India' Initiative*. IEEE.

## Projects

**Modified Robot Gripper for Glass Handling**

- Conceptualized and simulated a robotic system in Webots for handling glass panels, with a custom end-effector ensuring smudge-free transport to an edge handling conveyor

**Senior Brakes Engineer | DJS Racing**

- Led and mentored a 12-member team to a national competition, applying DFMA principles to design and manufacture custom calipers, rotors, and pedal box assemblies, realizing a 22% weight reduction, improved ergonomics, and a 27% cost reduction for the department
- Conducted research on controlled braking for a Driverless Formula Student car, exploring regenerative braking, coated rotors, and rotor thermal simulations, resulting in informed recommendations across 4 research project

**Design and Development of a Mechanical Flywheel Battery**

- Built a Flywheel Energy Storage System with 80% efficiency, utilizing a modified Laval disc flywheel and axial flux alternator for energy conversion, achieving 29% weight reduction and 30% cost savings through material strength analysis and topology optimization