Jaykumar Goswami

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Summary

Dedicated Robotics Engineer with expertise in robotics, automation, electronics and CAD modeling. Experienced in designing autonomous systems and smart manufacturing solutions. Pursuing a Master's in Robotics at Northeastern University. Passionate about innovative robotics projects and technological advancements.

Technical Skills

Robotics and Automation: ROS, AMR & ASRS Development, IIoT, PLC & HMI Systems, Digital Twin, PID Control
Electronics and Embedded Systems: Circuit Design, Custom PCB Design, Sensors and Actuators Integration, Microcontrollers, Embedded System Design
Design and Simulation Software: CAD Modeling (Fusion 360, Creo, SolidWorks), FEM analysis, Topology Optimization, ABB Robot Studio, LabVIEW, Unity
Prototyping and Fabrication: 3D printing (SLA and FDM), 3D scanning, CNC machining
Programming Languages and Tools: C/C++, C#, Python, MATLAB, Linux, CODESYS, Thingworx, Kepserver

Education

Northeastern University — Boston, MA
Master of Science - Robotics (Concentration: Electrical and Computer Engineering) — *Sep. 2024 – May 2026*

Birla Vishvakarma Mahavidyalaya — Gujarat, India
Bachelor of Technology - Electronics Engineering (Grant-In-Aid) - CGPA: 8.20/10 — *July 2019 – June 2023*

Experience

Junior Research Fellow — Aug. 2023 – Aug. 2024
Birla Vishvakarma Mahavidyalaya, Digital Manufacturing Lab — *Gujarat, India*

- Designed a 360kg capacity Automated Storage and Retrieval System (AS/RS), ensuring industry-grade standards.
- Led the development of an autonomous Mobile Robot (AMR) with 1500kg loading capacity, reducing manual handling by 60%. Utilized 3D printing for prototyping components and validating designs.
- Created an industry-grade smart manufacturing training kit with PLC, HMI, Gateway, and I/O link master, enabling advanced process monitoring and better control. Used PTC Thingworx & Kepserver for IIoT capabilities
- Worked part-time on a 14 degrees of freedom (DoF) biped robot, simulating and replicating human walking patterns. Designed custom PCBs for specialized DC motors with encoders and implemented I2C protocol for efficient multi-controller communication.

Summer Intern, Student Exchange Program — July 2023 – July 2023
Ural Federal University (UrFU) — *Yekaterinburg, Russia*

- Designed a bio-inspired robot gripper for the cake production industry, reducing weight by 40% and improving production line efficiency by 25% through FEM analysis and topology optimization.
- Simulated the assembly line using ABB Robot Studio, enhancing the efficiency of the cake production process.

Researcher — Dec. 2022 – June 2023
Space Application Centre - ISRO — *Gujarat, India*

- Built a digital twin model of a thermo-vacuum chamber and quantum payload using AR/VR and IoT technology, enhancing real-time monitoring and analysis capabilities by 50%.
- Successfully displayed real-time data on the digital twin, enhancing monitoring and analysis capabilities.

Publications

Research Papers and Patent

- **Jay Goswami**, Vinay Patel, Mehfuza Holia, Ashish Thakkar (Dec 2023) *"Unity-Based Digital Twin for 3D Printers: Bridging the Gap Between Virtual and Physical Realities."* Presented at Women in Science and Technology International Conference.
- Jai G. Singla, **Jay Goswami**, Keivalya Pandya, Darshan K. Patel, Vinay Patel, Mehfuza Holia (Jun 2023) *"Application of Digital Twin in Space Engineering Using Augmented Reality and Internet of Things Technology."* Published in Current Science Journal (Indexed by Scopus).
- Design Patent (No: 356336-001) of *"IoT Enabled Smart Upper Prosthetic Limb"* Granted by Government of India.