

JOYAL MICHAEL PUTHUR

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EDUCATION

Columbia University

New York, USA

Master of Science in Mechanical Engineering with concentration in Robotics & Control

Aug 2023 - Dec 2024

Coursework: Control Theory, Mechatronics, Digital Manufacturing | Teaching Assistant for Robotics Studio

University of Mumbai

Mumbai, India

Bachelor of Engineering in Mechanical Engineering

July 2020 - June 2023

Coursework: Product Design, Finite Element Analysis, Automation, Controls, Electronics, CAD/CAM

WORK EXPERIENCE

Robotics And Rehabilitation Lab (RoAR)

New York, United States

Research assistant

June 2024 - Present

- Engineered headbands for individuals with Cerebral palsy as part of a device boosting comfort scores by 30%
- Designed a pulley system with load cells in SolidWorks, enhancing functionality and reducing assembly time
- Built and validated a closed-loop controller with forward kinematics, achieving greater control precision and stability
- Calibrated load cells and motors, incorporating with DAQ system to achieve a 22% increase in sensor feedback stability

Indian Railways

Mumbai, India

Mechanical engineering intern

June 2022 - Dec 2022

- Constructed and fine-tuned a testing rig for W-type locomotive compressors with SolidWorks and FEA, improving mechanical performance and cutting setup time by 20%
- Integrated tachometers and temperature sensors for automated compressor monitoring, boosting accuracy by 18%
- Fabricated sensor fixtures to ensure stable data capture, increasing data consistency by 15% during performance tests
- Implemented a quality control strategy using FMEA, increasing component reliability by mitigating potential failure points

Zentech Industries

Nashik, India

Manufacturing intern

May 2019 - Aug 2019

- Designed and modified high-precision assemblies for 30+ components with SolidWorks and GD&T, improving manufacturability and reducing production cycle times with DFM/DFA
- Developed motorized fixtures for automated part positioning in machining processes, integrating servo controls to reduce setup time from 45 minutes to 32 minutes per batch
- Applied Lean Manufacturing techniques to streamline tool setup and conserve materials, boosting efficiency and reducing production time by 12%

SKILLS

Software: SolidWorks, AutoCAD, LabVIEW, MATLAB, Simulink, CATIA V6, Ansys, Slicers, MS Office Suite, Linux, Python, C

Tools: Actuators, Sensors, Embedded systems, Data Acquisition (DAQ) Systems, CNC, PLC, Machining

Techniques: PID, Kinematics, Additive Manufacturing, Rapid prototyping, Mechanical design, Mechatronics, Lean Manufacturing, DFM/ DFA, GD&T, Automation, Control Systems, Root Cause Analysis, Internet of Things (IOT), troubleshooting, 3D printing, BOM, Fabrication, Material selection, Documentation

Interpersonal Skills: Communication, Teamwork, Critical-Thinking, Leadership, Problem-Solving, Adaptability

PROJECTS

Autonomous Quadruped Robot with LiDAR Navigation (Columbia University, Robotics Studio course)

- Devised and built a modular chassis with 8-DOF indirect leg mechanisms, modeled in SolidWorks, and fabricated using FDM 3D printing, equipped with a 360-degree LiDAR (20Hz scan rate) for autonomous navigation within 12m range
- Led the development of control algorithms with hard-coded gaits using Central Pattern Generators, achieving stable locomotion at 0.2 m/s with 85% power efficiency

Food 3D printer (Columbia University, Digital manufacturing)

- Authored custom G-code for extrusion control, improved print resolution to 0.4 mm tolerance while reducing print failures
- Developed a PID control model in Simulink to regulate extrusion temperature, ensuring consistent flow during printing
- Tested and modified extrusion settings for various materials, achieved layer accuracy of 2 mm and reduced material waste by ~80g per print, enhancing usability for diverse food textures