Vikash Chauhan

Bachelor of Technology
Mechanical Engineering
Rustamji Institute Of Technology

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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech., Mechanical	Rustamji Institute Of Technology , B.S.F Tekanpur Gwalior	CGPA:8.61	2020
Senior Secondary	Govt. Model School,Morar Gwalior	Percentage: 84	2019
Secondary	Govt. Model School ,Morar Gwalior	Percentage: 91	2017

Experience

- **Orangewood Research And Advancement Private Limited[🌐]** *December 2023 - Present*
  Role:Project engineer Noida,India
  - Successfully completed research on a six-axis robotic manipulator, including parameter design, forward and backward kinematics, assembly, and actuator position control with dual encoder backlash compensation.
  - Conducted mechanical research and design for PCB stator motors, plunger brakes, and sandwich brakes, contributing to product development.
  - Developed gripper control systems using stepper motors and lead screw mechanisms, and implemented control systems for teaching manipulators via waypoints for food robotics
  - Designed various mechanisms for pick-and-place applications and integrated systems to control BLDC motors and encoders, including data collection and backlash compensation.

- **Swaayatt Robots Pvt. Ltd. [🌐]** *August 2023 to October2023*
  Role: Mechatronics Engineer project internship Bhopal,India
  - Engaged in automating the Mahindra Thar brake pedal using absolute encoders and Velodyne Lidar technology.
  - Conducted mechanical research and development for Automated Guided Vehicles (AGVs), focusing on inventory control management and embedded controller programming, including wheel odometry.

- **SH Forhealth Solutions Private Limited[🌐]** *June 2023 to July 2023*
  Role:Robotics Engineer Project Internship Pune,India
  - Developed robotic product ideas and prototypes for physiotherapy, focusing on manipulators and beneficial end effectors.
  - Designed attachments, including a shoulder wheel and pull-up bar, for passive and active rehabilitation exercises by the 3-axis manipulator.
  - Created a brake testing device for manipulators and extensively researched incremental and absolute encoder testing devices.
  - Programmed devices using Arduino Mega,ESP32 and STM32, contributing to mechanical shaft and manipulator assembly

- **Team Robolution RJIT(Robotics Team)[🌐]** *December 2020 To September 2022*
  Role: Robotic Team Core Member, Mechanical Training Head College Robotic Team,India
  - Led a robotics team in CAD/CAM software projects, focusing on microcontrollers, sensors, and project manufacturing.
  - Served as team lead for IIT Kharagpur competition (Sandrover) and achieved second-round runner-up in Parul University Roborace and Robosoccer.
  - Coordinated robot part design, assembly, and testing with system integration using Arduino, ESP32, and STM32

Projects

- **Six Axis Robotic Manipulator(Payload 4Kg)** *2024*
  Tools: SolidWorks, Fusion360,3D Print, URDF, RMD Actuators, ARSEC Actuators, DH Parameter, ROS RViz, ROS, CNC
  - Designed, assembled, and manufactured a six-axis manipulator using DH parameters, developing actuator iteration 2.

- Created URDF models for ROS Rviz and Gazebo simulations.
- Managed collaboration with vendors for joint link CNC manufacturing and ensured quality compliance for fabricated parts

- **Dual Encoder Backlash Compensate of gearbox and Actuator control: Orangewood Lab** *2024*
  Tools: Absolute Encoder, Planetary Gears, Harmonic Gearbox, ODrive S1, BLDC Motors, SSI, SPI, PWM, CAN Protocol
  - Researched and developed a hardware setup for a dual encoder project.
  - Implemented gearbox position control using SSI and SPI communication, controlled via PWM interface.
  - Utilized absolute encoders, BLDC motors, ODrive S1, and ODrive Pro with CAN communication.

- **Robotic finger Hand (holding capacity 2Kg)** *2024*
  Tools:Servo Actuators,ESP,Flex Sensors,C++ Programming, Python Tkinter (GUI),3D Printing, Sketch Design,Motion Planning
  - Designed and built a robotic hand with connected fingers using a custom mechanism.
  - Integrated servo actuators controlled by ESP and flex sensors for haptic feedback to enable realistic finger movements
  - Conducted research on motion planning and developed C++ code to control each finger's movement based on servo angles.
  - Created a graphical user interface (GUI) using Python's Tkinter to provide intuitive control and real-time monitoring of finger movements. Developed design sketches and prototyped the hand using a 3D printer, iterating the design for improved functionality.

- **PCB Stator Motor** *2023*
  Tools:SolidWorks,KiCad,PCB Manufacturing,ESC PWM Integration,ANSYS Maxwell, Electromagnetic Simulation
  - Conducted in-depth research on advanced PCB stator motors.
  - Designed, assembled, and simulated the motor using ANSYS Maxwell for electromagnetic coil analysis.
  - Developed a prototype of a PCB stator motor(axial flux motor), successfully testing its performance.

- **Mahindra thar (A.M.R)Mahindra thar brake pedal automate with lidar** *2023*
  Tools: Velodyne LiDAR,C++,CAN Protocol,WheelOdometry,LeadScrew Mechanism,Crank Lever Mechanism,Laser Cutting,CNC
  - Designed and manufactured hardware, including laser cutting and CNC fabrication.
  - Developed and tested mechanisms such as lead screw and crank lever for automating the brake pedal.
  - Worked on Python CAN protocol message transmission and reception, integrated wheel odometry, and programmed in Arduino/C++ to control the system. Set up LiDAR for 3D vision using Veloview software.

- **3 Axis Manipulator Attachment and Manipulator testing components** *2023*
  Tools:BLDC Motors,Lead Screw Mechanism,Encoders,Electromagnetic Brakes,Torque Sensors, Harmonic Gearbox,SolidWorks
  - Researched and developed components for a robotic manipulator, including various attachments (end effectors) equipped with torque sensors.
  - Worked with torque sensors, harmonic gearboxes, and CAD designs using SolidWorks, and prototyped using 3D printers to create and test different end effectors.
  - Utilized BLDC motors, lead screw mechanisms, encoders, and electromagnetic brakes for design and control.

Technical Skills and Interests

• **CAD/CAM Software, simulation and 3D Printer**: Solid Work(CAD Designer), Solid work assembly and simulation,Manipulator, AGV, AMR URDF generation, Fusion 360, Auto Cad, Creality/Ultimaker(3D Printer software).
• **C.N.C Machine Programming**: CNC Lathe Machine, G Code, M Code, Tool Command On cnc sinumerik 802D Software.
• **Manufacturing Skill**: Lathe Machinery , CNC Manufacturing, Laser cutting and tool Manually(Drill and grinding).
• **Programming Languages**:C++, Python,Arduino IDE Programming, CAN Interface for code and decode with the motor driver.
• **Mathematical Modelling**: Algebra, Calculus, Ordinary differential equations, Geometry, Numerical analysis, Wheel odometry, D.H parameter.
• **Operating System** : Windows , Linux(Ubuntu), Virtual Machine .
• **Coursework with cetification**: Basic Robotics, C language, python, CATIA.
• **Areas of Interest**: Robotics , Automation , A.G.V , Manipulator, Autonomous mobile robot, Humanoid robot.
• **Workshop With Certification**: Vehicle Communication, Active safety system in automobiles
• **Other Skills Work**:O drive s1, Robotics project, Arduino, Raspberry Pie, Sensors, Actuators, Drives, Pneumatic Control system, Robotic Wheels, Motors, motor driver.
• **Non-Technical Skill**: Technical robots-based research and development, Presentation Skill, Project Description And Planning with Team, Communication Skill, Team Lead And Training.

Positions of Responsibility And Achievements

- **Completed projects as a lead member on research projects**
- **Mechanical Branch Class Representative and volunteer for the management of the annual function** *2 .8 year*
- **Play a Vital Role in Orangewood hackathon**
- **Webinar speaker on the role of the mechanical department in robotics.**
- **Sucessfully led IIT Kharagpur sand rover competition**
- **Received 25,000 as winner prize money from the Chief Minister of M.P.**