SHAMBHAVI SINGH

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Education

Birla Institute of Technology and Science, Pilani — Goa Campus
B.E. Electrical and Electronics, M.Sc. Physics, CGPA 7.2 — *Aug 18 – May 23*

Presentation Convent Sr Sec School — Jammu
CBSE, XII Standard - 93% — *May 16 - May 18*

Work Experience

Development of Digital Panel Meter | *Remote internship - RMJ Automation, Mysore* May – July 20

- Worked in a team of 4 and collaborated with other teams for designing the Digital Panel Display Meter for temperature, current and voltage sensing and displaying on an LCD screen.
- Project was based on **LPC2138** and simulated using **Keil4 and Proteus**.

Technical Projects

Development of controller for robotic manipulator | *Mathematics Department*

- **Model Predictive Control** and **Linear Quadratic Optimal Control** of a two-link robot arm to be implemented
- Simulated using **ROS** and visualised in **Rviz and MoveIt**

Development of robotic manipulator | *Kratos - Mars Rover Project*

- Controlling a two link arm with inverse kinematics algorithm using **Python and ROS.** End effector control implemented separately
- **Circuit design** and implementation of connecting the actuators, drivers and controller board

Simulation and analysis of ad-hoc drone swarm networks | *Electrical and Electronics Department*

- Simulation of custom **decentralised ad-hoc TCP network of drones** using **Network Simulator 3**. Developing an interface with **ROS** for real world simulations
- Developed for deployment in disaster management and recovery. Language used is **C++**

Development of automated irrigation system using STM32 | *Electrical and Electronics Department*

- Interfacing of temperature and humidity sensors with STM32.Automating the solenoid valve actuator based on data received by sensors.
- Developed using **Keil5 and STM32CubeMX** and implemented on hardware.

Mechanical design of Modular Robots | *Electronics and Robotics Club*

- Led a team of 4 for the mechanical design of **autonomous self assembling modular robots** and development of an inter-locking mechanism for the system on **Solidworks**.

Simulation of period doubling bifurcation of biped | *Electrical and Electronics Department*

- Simulation of relationship among bifurcation points to show the **gait moves from bifurcation into chaos** and the process obeys the law that they have the same Feigenbaum universal constant. Simulated using **MATLAB**

Skills

Disciplinary Courses: Object Oriented Programming, Machine Learning, Operating Systems, Non Linear Dynamics, Computer Programming, Computational Physics, Control Systems, Digital Design, Microprocessors and Interfacing, Embedded Systems Design

Technical Skills: Python, C/C++, ROS, NS3, Wireshark, MATLAB, Simulink, AutoCAD, EagleCAD, Solidworks, Jupyter Notebooks, Git, Keil, Proteus

Positions of Responsibility

Coordinator | *Aerodynamics Club* May 19 – May 20

- Mentored juniors in groups of 10 on a bi-monthly basis for projects and competitions
- Organised quadcopter building and flying workshops for **80 students with a budget >2L**
- Organised and gave lectures in a **course for 40 students**
- **Inventory management** for a club of **150 people**, allocation of an annual **budget of 1L**

Co-curricular experience

Student Faculty Committee | *Electrical and Electronics Department* Aug 20 – Present

- **Represented 100+ students** of EEE department to the faculty in monthly meetings
- Eased transition to an online semester and acted as a link between faculties and students

Sandbox Student Committee | *Sandbox Innovation Lab* Aug 19 – Present

- **Inventory management for projects** and ensuring maintenance of equipment and machinery like 3D printers, laser cutters, plasma cutters etc
- Allocation and management of an annual budget of >10L as a part of the student committee.

Co lead - Employment Operations | *Nirmaan - Goa* May 19 – Dec 19

- Hosted several skill building (knitting/tailoring) workshops for more than 50 women in Zari and Lamani - biggest slum areas in Goa. Organised regular meets with Self Help Groups in both slums for updates. Sourced raw materials for them and supplied their products to vendors for sale.