SOUMYA RANJAN DAS

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Education

IIT ISM Dhanbad Expected May 2026

Bachelor of Technology in Electrical Engineering (SGPA: 8.67 / 10.00)(CGPA: 8.55 / 10.00) *Dhanbad, Jharkhand*

- **Relevant Coursework:** Signals Systems and Networks (Grade: A+), Analog and Digital Electronics (Grade: A+), Control Systems (Grade: A), Electrical Machines (Grade: A+), Electromagnetic Theory, Electrical Measurements ,Power Systems, Data Structures and Algorithms

Projects

Simulink Model and Simulation of DC Motor Control Using PWM and DC DC converter

| *Control Systems*, *Simulink*, *Electrical Engineering*

- I utilized Simulink to create a comprehensive model integrating a DC shunt motor and a buck converter. This simulation allowed for precise control and analysis of the motor's performance under varying conditions of voltage regulation and load. By implementing PWM signals within the model, I achieved accurate motor control, simulating real-world operational scenarios.
- Studied simulation of regenerative braking mode for separately excited DC motor, optimizing energy recovery during deceleration through controlled motor operation
- project github link: https://github.com/soumya-2911/DC_motor_control.git

SPICE SIMULATION, MATHEMATICAL ANALYSIS AND DESIGNING OF OSCILLATORS

| *Control Systems*, *Analog Circuit Design* ,*SPICE analysis*, *Electrical Engineering*

- SPICE analysis of oscillators and their design using NPN 2N2222 transistors for operation across various frequencies.
- Created simulations done AC analysis, Bode plots, and mathematical derivations of transfer functions.
- Wrote a comprehensive guide on designing oscillators from the ground up along with detailed and thorough mathematical analysis.
- project github link: https://github.com/soumya-2911/SPICE_Simulation_Oscillators

PID CONTROL USING NEURAL NETWORKS MATLAB SIMULATION

| *Control Systems*, *Matlab*, *Simulink*, *Electrical Engineering*, *Machine Learning*

- Modelled the Simulink model of a typical PID control System whose gains need to be predicted using neural network.
- Wrote the Matlab code of the neural network from scratch.
- Researched about backpropagation methods needed in the neural network through IEEE research papers along with its mathematics and implemented through matlab code.
- project github link: https://github.com/soumya-2911/pid-tuning-using-neural-network

MODELLING OF ROTARY INVERTED PENDULUM AND SELF BALANCING BIKE FOR EYANTRA ROBOTICS COMPETITION

| *Mathematical Modelling* , *Matlab*, *State Space Modelling*, *Control Systems*, *LQR Control*

- Developed the mathematical model of the Rotary Inverted pendulum using Matlab/Octave using State Space approach.
- Developed CoppeliaSim model of the Rotary Inverted Pendulum to implement and Simulate the Matlab/Octave code control logic on a 3D model.
- Developed the LQR ($LinearQuadraticRegulator$) control logic in the code and simulated and balanced the inverted pendulum. Thus achieving a spot among the top 50 teams in stage 1 of the competition.
- Used microcontrollers such as Arduino Nano and sensors such as IMU sensor for making a self balancing bike.
- project github link: https://github.com/soumya-2911/projects-Eyantra_lunarScout

Certifications

MATLAB
| *Mathworks*
- Certificate: https://matlabacademy.mathworks.com/progress/share/certificate.html?id=42f80efe-8fa9-4aa4-a0d6-1a41c320d7ab&

Supervised Machine Learning: Regression and Classification
| *Stanford, Coursera, online*
- Certificate: https://www.coursera.org/account/accomplishments/certificate/9TXBBEFTUXFB

OPENCV
| *Opencv.org, online*
- Certificate: https://courses.opencv.org/certificates/0b37355190b14fe8b4c8d4d31130a3bc

Technical Skills

Technologies: Matlab, Simulink, SPICE modelling, Arduino
Concepts: Controller design, DC-DC Converters (Buck, Boost, Buck-Boost), Bidirectional DC-DC Converters, Analog Electronics, Digital Electronics, Power Electronics, Electrical Machines, Machine Learning

Achievements

- Acheived 2nd prize in Circuit Simulation Challenge in Concetto'23, IIT Dhanbad.
  - Certificate: https://app.truscholar.io/profile?credId=663cdc6240a3d8590e07d040
- JEE Advanced'2022 rank: 7510
- JEE Mains'2022 score: 97.93 percentile

Social Engagements

Tech Coordinator : at Electronics and IOT club -tech club of IIT Dhanbad