Rudrajyoti **Roy**

Electronics and Communications Engineer · Aspiring Researcher

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Summary

Electronics and Electrical Communication Engineering student and aspiring researcher with a strong interest in Digital and Mixed-Signal VLSI Circuit Designing and Verification, Computer Architecture and Embedded Systems Design, Internet-of-Things Applications and Reliable Cyber-Physical Systems development. Sound understanding of Analog and Digital Electronics, Signal Processing, Control Systems, Algorithms.

Education

Indian Institute of Technology (IIT), Kharagpur — *Kharagpur, West Bengal, India*

B.Tech in Electronics and Electrical Communications Engineering (3rd Year Ongoing) — *Jul. 2018 - Present*

- Cumulative Grade Point - **9.17** · Additional Cumulative Grade Point - **9.46** (After 5th semester)
- Minor in Computer Science and Engineering
- Micro-Specialization in Embedded Control, Software, Modelling and Design

Skills & Coursework

Electronics Coursework	Analog Electronics, Digital Electronics, Signals and Systems, Analog, Digital Communications, Control Systems
Micro-Specialization	Embedded Sensing, Actuation, Interfacing, Micro-controller Embedded Systems, Embedded Control Systems
Other Coursework	Digital Signal Processing, Cyber-Physical Systems, Algorithms-I, Parallel Programming(CUDA)
Software Skills	C, C++, CUDA C, Python, MATLAB, Simulink, Arduino IDE, LTSpice, Verilog (Xilinx ISE)
Other Skills	Algorithms, Machine Learning, Deep Learning(Coursera), Image Processing, Computer Vision
VLSI Summer School	Analog Frontend Design, Gain-Bandwidth Optimisation using Genetic Algorithm, ML/DL on edge devices
Languages	English, Hindi, Bengali

Research Experience

Selective Detection of Multiple Volatile Organic Compounds in Air Employing ZnO Nanorods using Principle Component Analysis — *IIT Kharagpur*

Guide :- Prof T K Bhattacharyya (E& ECE Dept) | Mentor :- Mr. Avik Sett — *Dec. 2019 - Present*

- Designed a python code for automated pre-processing, segmentation and classification of time-series dataset obtained from Gas Sensor array when periodically exposed to Dry Air mixed with Volatile Organic Compounds (e.g Acetone, Ethanol).
- Created an automated KNN based classifier on Principal Component Analysis plot, that predicts the gas present in the mixture with remarkable accuracy. Presently working on detection of multiple organic compounds in a mixture of gases.
- Co-authored a paper about the research, that has been published at **IEMENTech conference 2020**(IEEE certified).

SWARM Robotics Research Group — *IIT Kharagpur*

Electronics and Embedded Team Head — *Mar. 2019 - Present*

- Designing and component-level testing (on breadboard) for a custom PCB for control, sensing, actuation and data communication in robots.
- The main objective of research is to analyse and design efficient algorithms to enable a decentralised swarm of bots to collaborate and complete tasks such as large area localization, mapping, shape formation etc.

Awards & Achievements

Competitions

Jul. 2020	**Semi-Finalist**, Flipkart GRiD 2.0 Autonomous Indoor Drone Challenge	*Bangalore, India*
Jan. 2020	**Second-Runner Up**, Tesseract (Autonomous Arduino-Based Robotics Challenge) Team Leader	*Kshitij, IIT KGP*
Mar. 2020	**VS Hall Team Member**, Inter-Hall Product Design Competition	*TSG, IIT KGP*

Academic Achievements

2020	**Top 10%**, Present position in my batch in terms of CGPA	*IIT Kharagpur*
2018	**All India Rank 1320**, JEE Advanced Examination	*India*
2018	**All India Rank 2803**, JEE Mains Examination	*India*
2017	**All India Rank 3**, KVPY SA-E Research Fellowship Examination	*India*

Extracurricular Activities

Sports	Chess, Table-Tennis, Badminton
Music	Member of Hall Band(East Indian Vocalist), Participated in Open IIT contests
Volunteering	Taught poor kids and engaged in social welfare of remote villagers as an NSS volunteer