

JOYDIP ROY

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Bangalore, India

SUMMARY

Presently employed at Honeywell, under Advanced Sensing Technology - Healthcare Solutions team, specializing in the characterization and calibration of lab-fabricated sensors, signal conditioning circuits, customized PCB prototypes, microcontrollers, data acquisition systems, and healthcare products and innovation in this space. Completed a Master of Science in Electrical Engineering at the Indian Institute of Technology, Kharagpur, India, while serving as a Senior Research Fellow on a SERB, DST-sponsored project. Previously held a position as an Electrical Engineer, amassing over two years of experience in the Engineering/Construction sector. In a nutshell, proficient in various industry skills including sensors, electronics, project planning and management, innovation, construction methodologies, procurement, inspection processes, engineering design approval, and site supervision.

WORK EXPERIENCE

Honeywell Technology Solutions Pvt Ltd, Bangalore, India

June 2022 – Present

Electrical Engineer - II

- **Working cohesively with a global team to execute NPI Projects/Platforms and contribute to ongoing sustenance projects:**
 - Worked on pressure sensor characterization and calibration. Used data for statistical analysis to derive product specifications.
 - Conceptualized design ideas for NPI project and delivered outcomes as per deadlines.
 - Prepared circuit schematics, and designed PCBs to prepare POCs for concepts as a part of NPI deliverable.
 - Worked with ASICs and sense dies for flow sensors.
 - Analyzed sensor data using Six Sigma tools (Regression, Hypothesis testing, GRR, Pugh Matrix, Process capability, etc). Did root cause analysis for failure modes, using '5 Why?' and 'Fishbone diagrams'.
 - Did teardown failure and defect analysis of sensors using SEM and EDX studies.
 - Collaborated and helped meet accolade deliverables as part of product release - DFMEA, MRS/PRS, eeBOM/Schematic/PCB, CTR/CDR, and others.
- **Innovation/ Develop Next-Gen Technology along with IP development:**
 - Developed an innovative image-based solution for an NPI project - Granted as a Trade Secret (25 July 2024).
 - SPS Ignite: submitted an idea on a non-invasive healthcare solution, selected among the top 27 of nearly 400 ideas in the business group (SPS).
 - Explored various memory storage and retrieval concepts (EEPROM, OTP EEPROM, Barcode, QR Code, Dot Matrix, RFID, and NFC) as an initial idea for Liquid Flow NPI.
 - Innovation in the healthcare space with non-invasive sensing techniques and IP development.
- **Skill Development & Expansion:**
 - Worked with different microcontrollers, and Honeywell ASICs; familiar with the ASIC architecture and the commands.
 - Took up regular learning and training as a part of continuous skill development in company-sponsored platforms.

Indian Institute of Technology, Kharagpur, India

October 2017 – June 2022

Senior Research Fellow and Junior Research Fellow

- Developed and IoT enabled automatic ranging, temperature compensated water quality monitoring system. This work also resulted in SCI-indexed Journal and Conference paper.
- Developed SMD-based prototype from the ground up and calibrated and programmed the same for remote monitoring using WiFi and BLE protocol.
- Developed lab-fabricated sensors, designed signal conditioning and power supply circuit as an initial prototype.
- Worked on sensor calibration, electronic calibration for the conductivity sensing using the indigenous sensor in a customized PCB designed in-house.
- Performance study of the same sensor in different setups to ensure that it can be used in real world scenarios.

SK Samanta & Co Pvt Ltd

August 2015 – October 2017

*Electrical Engineer (Design and engineering - Kolkata)**August 2016 – October 2017*

- Experience in design engineering- *AutoCAD drawings, Cable calculations and schedules, Illumination system, Earthing calculations, approval of drawings, Inspection of equipment at vendor's workshop, Site coordination.*

*Graduate Engineer Trainee Electrical (Site co-ordination - Bhilai and Dhanbad)**August 2015 – August 2016*

- Experience in installation of equipment in Electrical Substation such as: *HT and LT Switchgear, PMCC, MCC, MLDB, PLC/RIO, Bus duct, Transformer, Battery charger, Ventilation System, Capacitor Bank with ACDB, laying and termination of LT & HT (heat shrinkable) cables, Cable tray arrangements, Illumination (indoor, outdoor and peripheral), Earthing and Lightning protection.*
- Experience in conveyor system - *Drives, Safety switches and Shuttle conveyor*
- Experience in Bunker System- *Travelling tripper, Plough/Paddle feeder*
- Experience in Track hopper- *Wagon Tippler*

TECHNICAL SKILLS AND EXPERTISE

Circuits: Simulation (MATLAB, Proteus, Falstad-web), Power and signal circuit prototyping (breadboard, perf/dot PCB), Schematic & PCB design with routing and Gerber generation (Proteus, Autodesk Eagle)

Lab Equipments: Digital multimeter (DMM), Function generator, Power supply, Digital Storage Oscilloscope (DSO), Soldering station, LCR meter/ Impedance/Spectrum Analyser, other lab accessories.

Microcontrollers/Microprocessors: Arduino UNO/Nano(Arduino IDE), ESP8266, ESP32 (Arduino IDE, ESP IDF), Microprocessor architecture (Registers, Accumulators, Flags, Interrupts, Addressing), Peripherals (ADC, DAC, I/Os, memory), SPI, I2C, UART, BLE, WiFi, TCP/IP protocols, Data logging (local SPIFFS, cloud platforms), Embedded and IoT system.

Programming: C, C++, Java, Python3, HTML/CSS/Javascript

Industry: Electrical Substation (Switch-gears & Control panels, PLC/RIO/HMI, Transformers & Bus-Ducts), Conveyor Systems & Drives, Conveyor Safety switches and BWS, Engineering drawings/ Scheme diagrams, Site-coordination and Equipment Inspection.

AWARDS AND ACHIEVEMENTS

GATE Rank holder: *Qualified and secured **AIR-1650 (PERCENTILE- 98.7%)** in Electrical Engineering (EE) paper of Graduate Aptitude Test in Engineering (GATE) 2015*

Principals Award: *Received Principals Award in 2009 (at the end of secondary school) for high achievements in studies and notable service to others along with being an active member and Vice President of Science club (Physics dept.). Was accepted as a member of the **De Nobili Honor Society** of De Nobili School, FRI, Digwadih, Dhanbad.*

EDUCATION**Indian Institute of Technology***MS (by Research)**Electrical Engineering*

Kharagpur, WB, India

*January 2019 – August 2023**(CGPA: 9.2/10)***Meghnad Saha Institute of Technology (MAKAUT/WBUT)***B. Tech**Electrical Engineering*

Kolkata, WB, India

*August 2011 – July 2015**(CGPA: 8.41/10)***The Pentecostal Assembly School***AISSCE - CBSE**Pure Science - CS*

Bokaro, JH, India

*May 2009 – March 2011**(83.6%)***De Nobili School - CFRI***ICSE - CISCE**General*

Dhanbad, JH, India

*March 2009**(89.57%)*

TRAININGS AND CERTIFICATIONS

LabVIEW Classroom Training: Undergone an instructor-led classroom training program (June-August, 2023) on LabVIEW Core 1, Core 2 & Core 3 in Honeywell (HTS-SPS).

Vocational Training: Undergone a 21 days of vocational training (24 June - 14 July 2014) at Mills and Utilities Electrical Maintenance department of TATA Steel Limited, Jamshedpur. The project title was "To Study BLA PLC at HSM (Hot strip mill)".

Vocational Training: Undergone 15 days vocational training (23 Dec, 2013 to 06 Jan, 2014) at 10MW Power Plant, Jamadoba in TATA Steel Limited, Jharia division, as a partial fulfillment of curriculum required for B.Tech degree. The training and report was on "Transformer Parts, Protection, Testing and Maintenance".

30 Days Master Class on Matlab Simulink: Successfully completed "30 Days Master Class on Matlab Simulink" at Pantech Prolabs India Pvt Ltd in association with Andhra Pradesh State Skill Development Corporation (APSSDC) from Nov 23 to Dec 22, 2020.

Essentials of Entrepreneurship: Thinking & Action: Successfully completed an online non-credit course in Coursera on "Essentials of Entrepreneurship: Thinking & Action" authorized by University of California, Irvine.

Coding Fundamentals: Successfully completed "Coding Fundamentals" of Javascript by Grasshopper. Learned about functions, variables, arrays, if statements, operators, loops, objects, and much more. The course uses JavaScript, but the concepts can be applied to any coding language.

PLC and its Applications: Participated in the workshop on "PLC and its Applications" held at the Electrical Engineering Department of Meghnad Saha Institute of Technology, Kolkata from Feb 6 to Feb 11, 2014.

PUBLICATIONS

Journal Publications

- Avishek Adhikary, **Joydip Roy**, Anaparthi Ganesh Kumar, Susanta Banerjee, and Karabi Biswas. "An Impedimetric Cu-Polymer SensorBased Conductivity Meter for Precision Agriculture and Aquaculture Applications." in IEEE Sensors Journal 19, no. 24 (2019): 12087-12095.

Conference Proceedings

- Avishek Adhikary, **Joydip Roy**, and Karabi Biswas. "Performance study of a two-electrode type aqueous conductivity sensor for smart farming." In 2019 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), pp. 1-6. IEEE, 2019.

POSITIONS OF RESPONSIBILITY

Teaching Assistant: Teaching Assistant for Electrical Technology (EE11003) Tutorial for the spring 2021 semester. Was responsible for the grading of homework.

Organizer of FOS 2020 and FOS 2018: Was an organizing committee member of the workshop on Fractional Order Systems (FOS'20) held from 15th to 19th Feb 2020 and FOS'18 from 16th to 20th Feb 2018 at the Electrical Engineering Department of IIT Kharagpur. Was responsible for the logistics and accommodation of the Speakers and Participants of the workshop. Was responsible for demonstrating and coordinating simulations and hands-on experiments during the workshop.

Organizer of DAIS 2019: Was an organizing committee member of the AICTE-QIP sponsored short-term course named Data Analytics for Instrumentation System (DAIS'19) held from 15th to 21st Feb 2019 at the Electrical Engineering Department of IIT Kharagpur.

Vice President of Science Club: Vice President of Science club (Physics dept.) in secondary school. Was an active member of the club and presented various scientific models, charts, experiments, and exhibitions.

EXTRA CURRICULAR ACTIVITIES

- Apart from work have an active interest in exploring the latest technology, science behind everything, linguistics, philosophy, geography, culture & food, travel & exploration, human history and evolution, bio-mimicry, economy & finance.
- Actively participated in quizzes (Environmental quiz-1st prize, GK quiz-3rd prize, Science quiz-runners-up), competitions (Sit and draw-1st prize, IQ test-1st prize, Maths olympiad, NSO, NSTSE, singing, elocution, extempore, annual sports), and school clubs (GK, Science and Geography club)
- Participated and organized annual exhibitions in school. Won the "Best Model Award" for a scientific demonstration during the science exhibition.