Subham Das

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Education

Indian Institute of Science Education and Research Bhopal **Aug. 2018 – Jun. 2023**
BS-MS in Electrical Engineering and Computer Science, Minor in Biology *Madhya Pradesh, India*
- CPI: **9.41** (on a 10-point scale) - Till 9th Semester (**Transcript**)

Our Own English High School, Boy's Branch **2018**
AISSE-CBSE CLASS 12 *Sharjah, UAE*
- Percentage: **96.2**% - Science Stream

Our Own English High School, Boy's Branch **2016**
AISSE-CBSE CLASS 10 *Sharjah, UAE*
- CGPA: **10** (on a 10-point scale)

Relevant Coursework

- Introduction to MEMS
- Smart Sensing Devices
- Machine Learning
- Immunology & Signaling
- Epigenetics
- Molecular Biology
- Analog & Digital Circuits
- Digital Image Processing
- Internet of Things
- Multivariable Calculus
- Biostatistics
- Bioinformatics

Publications

Patent(s)

- Mitradip Bhattacharjee, Subham Das, "A multisensor assisted system for diagnostics, disease detection, and thereof", (Indian Patent Appl. under processing) 2022.
- Mitradip Bhattacharjee, Subham Das, "A system for image analysis based colorimetric sensing", (Indian Patent Appl. under processing) 2022.
- Mitradip Bhattacharjee, Ariba Siddiqui, Subham Das, "A multi-organ theranostic device ", (Indian Patent Appl. under processing) 2022.

Journal Article(s)

- Subham Das, Mitradip Bhattacharjee, "Image based Sensing of Leukonychia for Early Diagnosis of Anemia using a Smartphone Application", IEEE Sensors Letters (doi:10.1109/LSENS.2022.3217010).
- Subham Das#, Athul Krishnan#, Mitradip Bhattacharjee, "Flexible Piezoresistive Pressure and Temperature Sensor Module for Continuous Monitoring of Cardiac Health", IEEE Journal on Flexible Electronics (Under Review)(# Equal contribution)
- Ariba Siddiqui, Subham Das, Mitradip Bhattacharjee, "Acoustic Sensing Response in Human Tissues for Theranostics and Implants", IEEE Sensors Letters (Under Review)

Conference Publication(s)

- Subham Das, Lakhvir Singh, Mitradip Bhattacharjee, "Polymer-Based Flexible Multiparameter Sensor With Smartphone Integration", 6th IEEE International Conference on Emerging Electronics (ICEE), Bangalore, India, December 2022.
- Ariba Siddiqui, Subham Das, Mitradip Bhattachrjee, "Ultrasonic Power Distribution Analysis in Different Human Tissues for Bioimplant Application", IEEE SCEECS 2023 (Under Review)

Research Experience

Polymer-Based Pressure Sensor for Terrain Identification - Master's Thesis **August 2022 – Ongoing**
Supervised by Dr.Mitradip Bhattacharjee (Dept. of EECS) *IISER, Bhopal, India*
- Developed a capacitive pressure sensor that is capable for identifying the terrain it is placed on by analyzing the pressure profile of the surface. It is also capable of detecting nature of surface and can withstand high pressure.

Wearable Printed Sensors for Monitoring Patient Health **May 2022 – August 2022**
Supervised by Dr.George Knopf (Dept. of Mechanical and Materials Engineering) *University of Western Ontario, Canada*
- Developing a multi-purpose printable electronic sensor circuit for a variety of wireless devices that can monitor patient health. Developed the prerequisite, chipless readout system, with RFID frequency (13.56 MHz) and the components being purely RLC based. The system is such that any sensor can be replaced into the circuit and a reading obtained.

Developing a Database of Synthetic Logic Gates using NLP and ML **May 2021 – December 2021**
Supervised by Dr.Areejit Samal (Dept. of Computational Biology) *IMSc, Chennai, India*
- A database with compiled information regarding all synthetic logic gates discovered to date. The data was analysed using NLTK to give a suitable PUBMED search query and a sum total of 750+ logic gates were documented.

Phone Application For Health Monitoring - Bachelor's Thesis **June 2021 – April 2022**

Supervised by Dr.Mitradip Bhattacharjee (Dept. of EECS) *IISER, Bhopal, India*

- Developed an application that can provides data for four diagnostics (heart rate, oxygen level, blood pressure, and temperature) and predicts two diseases (arrhythmia and anemia). This is done using image processing techniques and a custom designed PCB.

Projects

Polymer-based flexible ultrasonic band for diagnostics | *COMSOL, Arduino* **August 2022**

- A flexible band capable of determining the blood flow velocity and width of forearm.

Detection of Parkinson's Disease | *ML and Deep Learning* **April 2021**

- Using the dataset provided by University of Oxford to check the probability of a patient having Parkinson's disease given different attributes and characteristics using different machine learning techniques.

Vahan Netra - Vehicle Vision | *Blender, Proteus 8* **August 2021**

- A safety helmet designed to reduce on road accidents of Light Motor Vehicles (LMV).

Analysis of Gene Expression in Yeast | *R, Bio-conductor* **October 2021**

- Differential gene and transcript expression analysis of RNA-seq experiments with TopHat and Cufflinks. CummeRbund, Integrative Genomics Viewer (IGV), and Gene Ontology Profiling analysis was done to see how the differentially expressed genes contribute in different biological processes.

Thermal and Pressure Sensor PCB Design | *Altium* **December 2021**

- Designing PCBs that are capable of taking temperature and pressure readings, thereby negating the need to use Arduino boards along with separate sensors.

Technical Skills

Languages: Python, C, HTML/CSS, MATLAB, R
Simulation Tools: COMSOL, Simulink, Ansys-HFSS
Modeling & **Electronics** : Blender, Solidworks, Arduino, ADS, NI Multisim, Altium Designer, Proteus 8
Electrical : Filter Circuit Design, Analysis of MOSFET Characteristics, Designing Amplifier Circuits Using OP-AMPS
Experimental : Synthesis of polymer based sensors, Analysis of Salts - Chemistry, Physical and Chemical Analyses of Crude and Refined Oils - Chemical Engineering
Others : Adobe Premiere Pro, Adobe After Effects, LaTeX

Awards / Co-Curricular Activities

MITACS Globalink Research Internship **2022**

- Selected for MITACS summer internship 2022, a training opportunity to perform research in Canadian universities

Reviewer for IEEE Applied Sensing Conference (APSCON) **2022**

Indian Academy of Science Summer Research Fellow **2021**

- Selected for IAS SRFP 2021, a programme which supplements research activities that occur during the academic year.

Vijyoshi - National Science Camp **2018**

- Took part in the National Science Camp organized by KVPY-IISc and Inspire at IISER Bhopal campus.

19th SOF National Science Olympiad **2017**

- Zonal Rank '2' in 19th SOF National Science Olympiad – was awarded a Silver Medal.

Brain O'Bee **2016**

- Participated in Inter School Neuroscience Competition (Brain O'Bee) held by Manipal University, Dubai.

Secretary of Cultural Council IISER Bhopal **2020 – 2021**

Member of Unnat Bharat Abhiyan **2021 – 2022**

- A government initiative for the upliftment of rural areas.

REFERENCES

Dr. Mitradip Bhattacharjee: Asst. Professor, Dept. Electrical Engineering and Computer Science, IISER Bhopal, India
Dr. George K. Knopf: Professor, Dept. Mechanical and Materials Engineering, University of Western Ontario, Canada
Dr. Areejit Samal: Professor, Dept. Computational Biology, IMSc Chennai, India