

Curriculum Vitae

PERSONAL INFORMATION

Amartyaraj Kumar

DOB: 24/10/1999

Place of Birth: Bardhaman, West Bengal, India

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RESEARCH INTERESTS

Photodetectors, Semiconductor-metal-electrolyte junction physics, Self-powered photoelectrochemical photosensors, Optoelectronics, Photonics, Spintronics, Energy harvesting modules (electromagnetic and piezoelectric), MEMS & NEMS technology, Smart Sensors (using capacitor, mechanical devices, Piezoelectric composition, MOSFET etc).

RELEVANT COURSES

Electronic Devices, Analog and Digital Electronics, Electromagnetic Theory, Introduction to MEMS, Smart Sensing Technologies, Nanoelectronics, Spintronics (audit), MOS Device Modelling.

EDUCATION

Indian Institute of Science Education & Research, Bhopal

BS-MS. (🏆 Proficiency Medal)

Department of Electrical Engineering & Computer Science (EECS)

2019 - 2024

CPI/CGPA : 9.04/10

Burdwan Municipal High School

Higher Secondary Education, WBCHSE

English, Mathematics, Physics, Chemistry, Biology, Bengali

2016-2018

Overall Score : 90.4/100

Mahesh Sri Ramkrishna Ashram Vidyalaya - H.S.

Secondary Education

WBBSE

2010-2016

Overall Score : 93.57/100

RESEARCH EXPERIENCES

Junior Research Fellow

Supervisor : Dr. Mitradip Bhattacharjee

i-Lab

Indian Institute of Science Education & Research, Bhopal

August 2024 - February 2025

Bhopal, India

Title : *“Electronically monitoring heart-wave acoustics of an analog stethoscope”*

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Master’s Thesis

Supervisor : Dr. Mitradip Bhattacharjee

i-Lab

Indian Institute of Science Education & Research, Bhopal

July 2023 - May 2024

Bhopal, India

Title : *“Self-Powered $\text{Cu}_2\text{O}(\text{CuO})$ Composite Based Vis-NIR Photodetector”*

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Research Internship

Supervisor : Dr. Kuntal Roy

Quantum NanoDevice Lab (QNDL)

Indian Institute of Science Education & Research, Bhopal

May 2023 - July 2023

Bhopal, India

Topic : *Characterization of photodiodes and ellipsometric analysis of spin-coated polymer on silicon wafers*

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Bachelor's Thesis

January 2023 - May 2023

Supervisor : *Dr. Santanu Talukder*

Bhopal, India

Sixth Sense Lab

Indian Institute of Science Education & Research, Bhopal

Title : *"MEMS-Based Piezoelectric Ambient Vibration Energy Harvester"*

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PUBLICATIONS

*"Ultrafast Self-Powered Copper Oxide Composite-Based Vis-NIR Photodetector Probe", **Amartyaraj Kumar**, Shivank Sahu, and Mitradiip Bhattacharjee, *ACS Applied Electronic Materials* **2024** 6 (9), 6457-6465, DOI : 10.1021/acsaelm.4c00940*

PATENTS

*"A MULTI-ORGAN THERANOSTIC BODY WEARABLE DEVICE", Mitradiip Bhattacharjee, Ariba Siddiqui, Subham Das, **Amartyaraj Kumar**, IN Patent Appl. 202421006385, 2024/2.*

*"A SELF-POWERED UV- NIR PHOTODETECTOR PROBE", Mitradiip Bhattacharjee, **Amartyaraj Kumar** and Shivank Sahu, IN Patent Appl. 202421055636, 2024/7.*

LABORATORY SKILLS

- **Instruments :** Digital Multimeter (DMM6500 6¹/₂ digit), Sourcemeter (SMU 2450), Vector Network Analyzer (VNA) basics, Function Generator, Mixed-signal Oscilloscope, Digital Oscilloscope, Ellipsometry (J.A. Wollam), Spin-coating (Holmarc HO-TH-05), SLA 3D printing basics (FormLabs 3B+).
- **IoT :** Arduino-uno, Raspberry Pi, ESP-32, ESP-8266, and their real-time monitoring applications with temperature sensor (LM35), pressure sensors and humidity sensors (DHT11, DHT22).

TECHNICAL SKILLS

- **Scientific Software :** COMSOL, QuantumATK, LTSpice, HighScore Plus, OriginPro, EDA playground (Verilog HDL), FreeCAD, SolidWorks, LabVIEW for instrument automation, Arduino IDE,
- **Programming language :** MATLAB (functions & live-script), Python (Pandas, NumPy, SciPy, Scikit-Learn, Streamlit, etc), HTML, CSS, \LaTeX .

ACADEMIC ACHIEVEMENTS

- Qualified GATE (Graduate Aptitude Test in Engineering), 2023.
- Qualified JEE (Join Entrance Examination), 2019, top 2.5 % percentile.
- Qualified WBJEE (West Bengal Join Entrance Examination), 2019, Rank - 699.
- Qualified IAT (IISER Aptitude Test), 2019.
- Prayas Science Talent Examination (Medha Anwesha), West Bengal, 2015, Standard - IX, State Rank - 1.
- Akhil Bhartiya Sanskriti Gyan Pariksha, West Bengal, 2011, 2013, District Rank - 3 (on both occasions).

LANGUAGE PROFICIENCY

Bangla, English, Hindi.

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REFEREES

Dr. Mitradiip Bhattacharjee

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Asst. Professor, Department of EECS,
IISER Bhopal, India

Dr. Kuntal Roy

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IISER Bhopal, India