



♂ (He/Him)

DOB: March 18, 1999 🏠

CONTACTS

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AWARDS

- 🌟 **SHE-INSPIRE Scholarship**
DST-Government of India
- 🌟 **Merit-cum-Means scholarship**
IISER-Mohali, India

SKILLS

Medical Imaging

Fiber-Optics

Ultrasound/Acoustics

Optoacoustics methods

VISHAL KUMAR

Product Developer & Researcher, SCTR's PICT, Pune, India, 411043

EDUCATION

📖 **Integrated BS-MS**
IISER-Mohali, Punjab (India)

2017 - 2022

Current Status: **Passed**

Programme	Subjects	Score	CONSTITUENTS
MAJOR	Physical Sciences	CPI: 8.2/10	Other courses + 1+ 2
MINOR	Data Sciences	-	Component 1
MS Thesis	Medical Physics	-	Component 2

RESEARCH EXPERIENCE

⚙️ **Product Developer & Researcher**
SCTR's Pune Institute of Computer Technology,
Pune, Maharashtra (India)

Nov 22 - Ongoing

Responsibilities: Applied Computer Vision, Machine learning, and AI applications to develop a system for real-time sign language recognition, Tried various CNN models to get improved learning, Automated SONY DSLR camera with Python to prepare the dataset, tried different Image Processing, and augmentation methods, and trained models in MATLAB and Jupyter-notebook (Python).

⚙️ **Research Assistant**
Birla Institute of Computer Technology, Deoghar,
Jharkhand (India)

Aug 22 - Nov 22

Responsibilities: Applications of Digital Image Processing, Segmentation, and optimization techniques

⚙️ **MS Thesis Project: To measure Young's Modulus of micron-sized particles using Photoacoustic methods** — Mentor - Dr. S.K Biswas

May 21 - Jun 22

Keys: Microscope - Class-3 Pulsed Laser - IR and Vis CW Lasers - Dichroics - Transducers - Optical-Fiber- SolidWorks - 3D printers - Optics tools - Lenses and Mirrors- Sputtering Machine - Electrospinning Machine - Desiccator - Oscilloscope - signal detection - FFT/NUFFT |Phantom fabrication - Data analysis - COMSOL Multiphysics - 3D-Simulation - MATLAB - Sputtering Machine - Ultrasound T/R - CNC Machine - DVD driver - Laser alignment

Brief Description: Proposed a novel method to measure the young's modulus and size of a micron-sized object using photoacoustic methods and performed a 3D simulation to validate the idea along with experiments.

Xray-CT and Optical-CT

Phantom Fabrication

CNC Machine, Sputtering Machine, & Electrospinning

Instrumentation

Image processing

Signal processing

Data Analysis

Electronic Devices

Arduino

Raspberry pi

IR Sensors

Stepper & Servo motors

Oscilloscope

XY translation stage

Coding

Machine Learning, AI and Computer Vision

Python

C++

Linux

MATLAB & Simulink

L^AT_EX

Design & Simulation

COMSOL Multiphysics

SolidWorks

Blender

Proteus 8.2

Spectroscopy

IR/FTIR spectroscopy

UV-Vis spectroscopy

⚙️ **Collaborative research @ Medical Physics Lab**
Indian Institute of Science Education and Research-
Mohali, Punjab (India)

Jun 21 - Jun 22

Responsibilities: Integrated electronics with fiber optics to perform Optical-CT experiments using Raspberry Pi, Created micro-machined cavities over optical fiber tip, Written code for Monte-Carlo implementation of Cone beam geometry, Performed simulation for Xray-CT experiment in Matlab.

My contribution- Interfacing electronics to Raspberry Pi and optical setup alignment.

ACADEMIC PROJECTS

⚙️ **2D-Simulation of the photo-acoustic effect using COMSOL Multiphysics.** — Mentor - Dr. S.K Biswas

May 21 - Jun 21

Keys: COMSOL Multiphysics - 2D-Simulation - MATLAB - k-wave simulation - Photoacoustic methods - FEM - Ultrasound signal - Light-Matter Interaction - Paper reading

Brief Description: Simulated light-matter interaction phenomena using COMSOL multiphysics and the k-wave toolbox of MATLAB to generate and detect photoacoustic signals from chromophores.

⚙️ **Modeling and analyzing standard electrical circuits using MATLAB's Simulink and its SIMSCAPE features.** — Mentor - Dr. Yash Pal

APR 20 - JUL 20

Keys: Simulation - Electrical circuits - MATLAB - Signal processing - Data Analysis - Inverse problem

Brief Description: Designed basic electrical circuits of transformer and studied voltage variation through simulation in Simulink.

⚙️ **Special Theory of Relativity and Tensor Analysis with an introduction to General relativity.** — Mentor - Dr. H.K Jassal

MAY 19 - AUG 19

Keys: Special theory of relativity - Tensor Algebra - General Relativity - Transformations - Three-body problems - Paper reading - Problems & Solution

Brief Description: Solved numerical problems of tensor algebra to understand the 4-vector equations of general relativity

⚙️ **Molecular distribution of n-alkanes in paleo-hydrology and paleo-vegetational changes.** — Mentor - Dr. Anoop Ambili

MAY 18 - AUG 18

Keys: Paleohydrology - Paleovegetation - Natural proxies count - Natural Organic compound - Reading Research papers

Brief Description: Read several research papers to understand the jargon of paleoclimatic variations.

ONLINE COURSE CERTIFICATES

🏆 **Image processing using MATLAB Onramp.**

JUL 2022

Issued by MATLAB

🏆 **Deep Learning using MATLAB Onramp**

JUL 2022

SOFT SKILLS



Languages

English	12+ yrs
Hindi	15+ yrs
Sanskrit	1+ yrs

ACHIEVEMENTS

Qualified level-1 geophysicist examination

Geo-scientist and geo-physicist prelim. examination, 2022

This exam is organized by the Union Public Service Commission(UPSC), Government of India.

EFSET

C2-PROFICIENCY IN ENGLISH

A certificate issued against the English level with a score of 71/100 on the EFSET score scale and C2 Proficient according to the Common European Framework of Reference (CEFR).

Issued by MATLAB

🏆 Deep Learning: Logistic Regression with Python MAY 2022

Issued by Coursera

🏆 Build Advanced Data Analysis and Transformation Skills in R MAY 2020

Issued by Coursera

🏆 Simulation and Modeling of Natural Processes using python JUL 2020

Issued by Coursera

🏆 Classify radio signals from space using KERAS APR 2020

Issued by Coursera

WORKSHOPS & CONFERENCES

🌟 Student Conference on Optics and Photonics (SCOP) by Optica OCT 2022

PRL, Ahmedabad — Poster Presentation

🌟 International Conference on Atomic, Molecular Optical and Nanophysics with Applications (CAMNP) DEC 2021

DTU, New Delhi — Attended the conference

🌟 3D Imaging - Display and Measurement JUL 2020

SPIE-CSIO, Chandigarh— Attended the conference

🌟 International Conference on Quantum Foundations, Technology, and Applications (QFTA) MAY 2019

IISER Mohali (2019)— Attended the conference

EXTRACURRICULAR

🏆 Intra-IISER Badminton Championship. JUN 2022
Organised at IISER-Mohali — Participated

🏆 Yoga Olympiad and Yoga Competition SEP 2021
Organised at IISER-Mohali — Participated

🏆 Inter IISER Sports Meet (IISM) JUL 2019
Organised at NISER-Bhubaneswar — Participated

🏆 College annual fest(INSOMNIA)-Rang-e-Royale FEB 2019
Organised at IISER-Mohali — 2nd prize

🏆 Forest Run Marathon-Shivalik Trail Run III DEC 2018
Organised at Chandigarh — Finisher medal

DECLARATION

I hereby declare that the above information is accurate to the best of my knowledge.