Abhinav Azad | Graduate Researcher

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I am a highly motivated multipotentialite passionate about art, cognition, mixed-media, and extended reality. I envision sustainable tech enriching our collective human consciousness.

Education:

Feb 2020- Feb 2021

Semester Exchange Program (6ᵗʰ &7ᵗʰ Sem)   - Czech Technical University in Prague

I was selected for the semester exchange program from IIT Madras to pursue specialization courses in Biomedical Engineering at CVUT in Prague, one of the largest universities in the Czech Republic and the oldest school of technology in Central Europe.

Jun 2017- July 2022

Bachelor's & Master's in Engineering Design   - Indian Institute of Technology Madras

This course offered me an interdisciplinary curriculum of Electrical and Mechanical sciences with the essence of **Design Thinking,** and master's specialization in **Biomedical Design**. **CGPA**: 8.14/10
IIT Madras is rated the best educational institute in India for the 5ᵗʰ time in a row by the National Institutional Ranking Framework (Source). IITs have an acceptance rate of less than 0.5%.

Professional Experiences:

July 2021- Present

Graduate Researcher | Under Prof. Giuseppe Riccardi   **- SIS lab, University of Trento**
- Conversational AI for health, affective computing in VR and augmented point of care with HMI.

July 2021- May 2022

IITM Dual Degree Project | Under Prof. Nirav Patel and Prof. Manivannan   **- IIT Madras**
- OBJECTIVE: VR Training module for minimum invasive neurosurgery & surgery planning on 3D Slicer.
- Characterization of Kuka IIWA and motion planning using various IK solvers on ROS/Unity, development of VR-based cross-platform Patient registration module across Unity and 3D-Slicer.

Feb 2020- April 2021

Data Analyst internship in Cerner Intelligence Group   - Cerner Healthcare
- OBJECTIVE**: Chest X-rays image analysis identifying abnormalities for COVID identification**
- Our pipeline involved CXR pre-processing, Lung RoI extraction using UNet segmentation, Ensemble Deep learning and feature visualization using **GradCam** for an effective **AI Explainability.**
- We achieved 98.3% precision in UNet **Lungs Segmentation** and over 95% accuracy **95%**, covid detection on CXRs with **cross-Val**. Our work has been selected for ICACDS conference 2022.

July-Oct 2020

Research Internship in Robot & Machine Perception Group   - CIIRC, CVUT Prague
- OBJECTIVE: **Real-time** detection of **miniature parts** in **Human-Robot interaction** assembly line on **Nvidia Jetson Nano** microcontroller and **Intel Realsense dept camera 435i**.   [Project link]
- Built on **ROS** and optimization by feeding select parts of the **HD stream** to the **CNN** by **additional Image processing** to detect new objects in the workspace.   **Guide:** Vaclav Hlavac
- Live detection of tiny parts with Full HD imaging on Jetson Nano was possible 61x faster, and currently drafting our paper to publish the research in international journals.

May-July 2019

Summer Internship at Nagaoka University of Technology, Japan | **Guide:** Prof. Okazaki M

I was among top 3 students from India, qualified for NUT Summer Industrial Research Internship.
- OBJECTIVE: **Fastening solution** for **Thermoset Plastics** for robust and repeatable usage.
- Utilized various Torque and load tests with **'Qualimate Torque Analyzer'** to **re-parameterize** the screws and developed **Saima tapping screws, "Special Nonserts"** for SAIMA Corporation, Japan.

Nov-Dec 2018	**Hand-held grain detector and analyzer at infyU LABS**, **- IIT Gandhinagar**

- OBJECTIVE: Develop a device to **identify rice types** and techniques to **segment, separate & use touching rice grains** samples to increase sampling efficiency, over **Raspberry Pi & Python.**
- METHOD: **Computer vision** to detect overlapping grains using **convexity criteria** on the rice grain contours and separated the contours to increase samples for learning and averaging.

Awards and Achievements:

July 2022	**Dronnadula Nagaratam Reddy Award -** For the student with the best academic record in GN 5001- Self Awareness course, IIT Madras Convocation 2022.
Feb 2021	**Ram Shriram Merit -** Secured scholarship among 14 students based on yearly performance
Dec 2018	**Inter IIT Gold Medalist: 7th Inter IIT Tech Meet -** winner among all the 16 IITs across India in '**BETiC**[3] **Medical Innovation Challenge**'. [Project link]
Sept 2015	**International Math Olympiad -** Secured 86th rank Internationally in 8th IMO by SOF
Aug 2015	**Winner at 'JIGNYASA Science Fair 2015 -** presented **"Inexpensive soil testing kit"** and alternati organic treatments for various soil profiles.
Feb 2013	**National Bal Shree Honor 2013 -** Received **India's most prestigious honor for youngsters** in the field of '**Scientific Innovations.**'

Position of Responsibilities:

Aug 2018 - July 2019	**Legislator of Narmada Hostel, Student Legislative Council**

- I was elected as the **legislative representative** among the **380+ students** of Narmada hostel, IITM.
- **Policies formulations** and involvement in **Student Governance** affecting nearly **10K students**.

2019-20	**Strategist, Physics & Astronomy Club of IIT Madras**

- As part of the **oldest clubs of IITM**, conducting various events, seminars, and observation sessions
- Facilitating & guiding students to pursue projects in physics and astronomy as a part of **CFI**[4]

Relevant Coursework and Skills:

•Computer Vision	•Medical Image Analysis	•Geometrical Modeling	•Biomechanics & Human Physiology
• ML/DL •IoT	•Digital Signal Processing	• Mechatronics	• Control systems • Probability
•Forms & Aesthetics	•Creative Design	•Design of Medical Devices	•Introductory Neuroscience*

My hobbies and Extracurricular Activities:

Fine-Arts	• Earned the recognition of the institute's **"Best Artist Award-2018"** in IIT Madras. • I have proficiency in various mediums: Oil painting, Watercolor, Acrylics, Sculpting, and Paper Mache.
Sports	• We Stood 3rd in Inter-Hostel Men's **Water Polo** among the Sixteen Hostels in IIT Madras. • I have been practicing Weightlifting, running marathons, Swimming, Tennis, and Badminton.
Astronomy	• Participated in a week-long professional **Astrophotography workshop** at Kausani, Himalayas. • I headed the Kilkari Science & Astronomy Club in Patna and conducted various star-grazing sessions.