



Abhinav Azad | PhD Candidate



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A young multipotentialite designer & engineer passionate about mixed-media and VR/XR based behavioural research in extended reality. Let's engineer sustainable technologies that enrich our collective human consciousness.

Education:

Nov 2023	Doctoral Programme (PhD Candidate) - CiTG, Delft University of Technology Topic: 'Comparison of Different XR Technologies for Pedestrian Behaviour Study' in MXR Lab.
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 a master's specialisation in Biomedical Design . CGPA: 8.14/10 IIT Madras is rated the best educational & research institute in India for the 5 th time in a row by the Nat Institutional Ranking Framework (Source). IITs have an acceptance rate of less than 0.5%.
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 specialisation courses in Biomedical Engineering at CVUT in Prague, one of the largest universities in Czech Republic.

Projects and Professional Experiences:

- Location:

Sep 2022- Oct 2023	Graduate Researcher Guide: Prof. Giuseppe Riccardi - SIS lab, University of Trento, Italy <ul style="list-style-type: none">Setting up of a new "Augmented point of healthcare Lab" with virtual agents & assistive robots.Designing an acquisition system of video, speech and bio-signals data for behavioural study in VR.Environment Design of virtual healthcare replica, Avatars design, rigging and affective computing in VR.Our paper on "Let's Give a Voice to Conversational Agents in Virtual Reality" got accepted for INTERSPEECH 2023 Show and Tell. (Dublin, Ireland)
July 2021- May 2022 (Master's thesis)	IITM Dual Degree Project Guide: Prof. Nirav Patel and Prof. Manivannan - IIT Madras, India <ul style="list-style-type: none">OBJECTIVE: VR Training module for minimally invasive neurosurgery & operation planning on 3D Slicer.Realised Virtual reality simulation on Oculus HMD, VR-based cross-platform Patient registration module across Unity and 3D-Slicer using Server DLL and OpenIGTLink. [Project Thesis]Designed and formulated an immersive behaviour study experiment for this HMI System validity in VR.Characterisation of Kuka IIWA and motion planning using various IK solvers on Unity and ROS.
Feb 2020- April 2021	Data Analyst internship in Cerner Intelligence Group - Oracle Cerner Intelligence, India <ul style="list-style-type: none">OBJECTIVE: Chest X-rays image analysis identifying abnormalities for COVID identificationOur pipeline involved CXR pre-processing, Lung RoI extraction using Unet-based segmentation, Ensemble Deep learning and feature visualisation using GradCam for effective AI Explainability.We achieved 98.3% precision in UNet Lungs Segmentation and over 0.98 AUC for covid detection on CXRs with cross-Val. We published a manuscript titled "<i>WE-Net: An Ensemble Deep Learning Model for Covid-19 Detection in Chest X-ray</i>", Chaudhuri, R., Nagpal, D., <i>*Azad, A., Pal, S.</i> (ICACDS 2022).
July-Oct 2020	Research Internship in Robot & Machine Perception Group - CIIRC², Prague, CZ <ul style="list-style-type: none">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]With ROS as backbone, we optimised detection time(61x faster) of tiny objects in the workspace by selectively feeding slices of HD stream to the YOLOv5. Guide: Vaclav Hlavac

May-July 2019	Summer Internship at Nagaoka University of Technology Guide: Prof. Okazaki M - Japan Qualified among top 3 students for NUT Summer Industrial internship in Fastening solution at Saima.
2019	Mind wandering project at Rehabilitation Bioengineering Group - IIT Madras, India <ul style="list-style-type: none"> • OBJECTIVE: Detection of Cognitive stress and attention during virtual driving simulation. • Artefact removal, pre-processing and feature extraction from high-frequency Alpha & Beta brainwaves. • Machine learning classifiers based on P1 & N1 ERPs on the acquired EEG and HRV from ECG signals.
Nov-Dec 2018	Hand-held grain detector and analyser at infyU LABS, - IIT Gandhinagar, India <ul style="list-style-type: none"> • OBJECTIVE: To develop a handheld device grain analyser to predict rice types. Segmenting and separating overlapping rice grain samples to increase sampling efficiency on Raspberry Pi. • METHOD: Computer vision to detect overlapping grains using convexity criteria on the rice grain contours and separate the contours to increase samples for learning and averaging.

Awards and Achievements:

July 2022	Dronnadula Nagaratam Reddy Award – Awarded as the student with the best academic record in “GN5001- Self Awareness” course at IIT Madras Convocation ceremony 2022.
Feb 2021	Ram Shriram Merit – Education scholarship awarded to 14 students based on overall performance.
Dec 2018	Gold Medal Winner: 7th Inter IIT Tech Meet - Among the 16 IITs across India in ' BETiC³ nationwide Medical Innovation Challenge '. [Project link]
Sept 2015	International Math Olympiad - Secured 86 th rank Internationally in 8 th IMO by SOF
Aug 2015	Winner at JIGNYASA Science Fair - Inexpensive testing kit and organic treatments for soil
Feb 2013	National Bal Shree Honor 2013 - Received India's most prestigious honour for youngsters in the field of 'Scientific Innovations.'

Position of Responsibilities:

2018 -19	Legislator of Narmada Hostel, Student Legislative Council <ul style="list-style-type: none"> • I was elected as the legislative representative among the 380+ students of Narmada hostel, IITM. • Policies formulations and involvement in Student Governance influencing nearly 10K students.
2019-20	Strategist, Physics & Astronomy Club of IIT Madras <ul style="list-style-type: none"> • 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 CFI⁴

Relevant Coursework and Skills:

• Computer Vision	• Medical Image Analysis	• Geometrical Modeling	• Computational Neuroscience
• ML/DL	• IoT	• Digital Signal Processing	• Forms & Aesthetics
• Mechatronics	• Probability	• Creative Design	• Design of Medical Devices
• Unity & VR development	• Product Design		

My hobbies and Extracurricular Activities:

Fine-Arts	<ul style="list-style-type: none"> • 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.
Astronomy	<ul style="list-style-type: none"> • 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.

(1) HTIC: Healthcare Technology Innovation Centre (3) BETiC: Biomedical Engineering Technology & Incubation Centre, IIT Bombay

(2) CIIRC- Czech Institute of Informatics and Robotics (4) CFI: Centre of Innovation, IITM [BLUE TEXT is Hyperlinked](#) (📄) **Publication reference**