



Abhinav Azad | Final-year master's student



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I am a highly motivated multipotentialite passionate in art, science, and technology. I wish to become a researcher developer and contribute to the human-centred advancements for sustainability.

Education:

Feb 2020- Feb 2021	Semester Exchange Program (6th & 7th Sem) - Czech Technical University in Prague
	I was selected for semester exchange program from IIT Madras for pursuing specialization courses in Biomedical Engineering at CVUT in Prague which is one of the largest universities in the Czech Republic and the oldest Institute of technology in Central Europe.
Jun 2017- Present	Master's & Bachelor's in Engineering Design - Indian Institute of Technology Madras
	The Department of Engineering design in its kind is unique with the curriculum as a combination of Electrical and Mechanical engineering which are introduced with the essence of Design Thinking to tackle the modern engineering problems. <u>CGPA: 7.75/10</u> IIT Madras is rated the best educational institute in India for 4 consecutive years by National Institutional Ranking Framework (Source). IITs have an acceptance rate of less than 0.5%.

Professional Experiences:

June 2021- Present	IITM Dual Degree Project Under Prof. Nirav Patel
	<ul style="list-style-type: none"> • OBJECTIVE: Implementation and optimization of Kuka IIWA for minimum invasive neurosurgery • METHOD: Characterization of Kuka IIWA and RL techniques to minimize deformational errors
Feb 2020- Present	Data Analyst internship in Cerner Intelligence Group - Cerner Healthcare
	<ul style="list-style-type: none"> • OBJECTIVE: Chest X-rays image analysis identifying abnormalities for COVID identification • METHOD: Improvisation in model learning with limit dataset using DL and image processing, unbalanced data handling, feature visualization for AI explainability using GradCam <p>OUTCOME: 98.3% precision in Lungs Segmentation on UNET and achieved covid detection on CXRs with cross-Val accuracy over 95%, work to be published in international conferences</p>
July-Oct 2020	Research Internship in Robot & Machine Perception Group - CIIRC, CVUT Prague
	<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] • METHOD: Built on ROS and optimization by feeding select parts of Live HD stream to the CNN by additional Image processing to detect new objects in the workspace. <u>Guide: Radoslav Škoviera</u> • OUTCOME: 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 <u>Guide: Prof. Okazaki M</u>
	<p>I was among the top 3 students from India qualified for NUT Summer Industrial Research Internship.</p> <ul style="list-style-type: none"> • OBJECTIVE: Fastening solution for Thermoset Plastics for robust and repeatable usage. • METHOD: Designing experiments for testing the screw's resulting torques using 'Qualimate Torque Analyzer' under varied load and materials to re-parameterize the screws. [Project Thesis link] • OUTCOME: Developed SAIMA tapping screws, "Special Nonserts" for SAIMA Corporation, Japan.

Nov-Dec 2018	Hand-held grain detector and analyzer at infyU LABS, - IIT Gandhinagar <ul style="list-style-type: none"> • 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. • OUTCOME: Developed a Hand-held multi grain analyzer and currently working over the Patent.
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Awards and Achievements:

2021	Ram Shriram Merit - Secured scholarship among 14 students based on yearly performance
Dec 2018	Inter IIT Gold Medalist: 7th Inter IIT Tech Meet - IIT Bombay <ul style="list-style-type: none"> • Winner among all the 16 IITs across India in 'BETiC³ Medical Innovation Challenge'. [Project link] • "Ergonomic Crutch" for assisting physically disabled, tackling problems in existing crutches. Analyzed gait patterns & developed modern crutch suitable in workspace for Indian patients.
2015	International Math Olympiad - Secured 86th rank Internationally in 8th IMO by SOF
August 2015	Winner at 'JIGNYASA Science Fair 2015 - Hubli, Karnataka <ul style="list-style-type: none"> Developed "Inexpensive soil testing kit" for investigation and organic treatment of various soil type.
Feb 2013	National Bal Shree Honor 2013 - National Bal Bhawan, New Delhi <ul style="list-style-type: none"> • Received India's most prestigious honor for youngsters in the field of 'Scientific Innovations'. • Qualified State, Zonal and National level innovation challenges involving problem solving.

Position of Responsibilities:

Aug 2018 - July 2019	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 affecting nearly 10K students.
2015-17	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	•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	<ul style="list-style-type: none"> • I earned the recognition of Institute's "Best Artist Award-2018" in IIT Madras. • I have proficiency in various mediums: Oil painting, Watercolor, Acrylics, Sculpting, Paper Mache.
Sports	<ul style="list-style-type: none"> • We Stood 3rd in Inter-Hostel Men's Water Polo among the Sixteen Hostels in IIT Madras. • I have been practicing Weightlifting, running Marathon, Swimming, Tennis, and Badminton.
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-gazing sessions.