Dhruv Jain | **22M0828**
Computer Science & Engineering | **M.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
jdhruvr@gmail.com | +91-9819001101 | **DOB: 29/02/2000**

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2025	9.46
Graduation	IIT Dharwad	IIT Dharwad	2022	8.89
Graduation Specialization: Electrical Engineering				
Intermediate	HSC	Pace Junior Science College	2018	83.69%
Matriculation	ICSE	HVB Global Academy	2016	93.17%

UTILITY PATENT, RESEARCH PAPER AND ACADEMIC ACHIEVEMENTS

- **Information processing method, computer program, and information processing device**
  *(Co-Inventor of Japanese Patent (2023-166812), Rights Owned by: **ExaWizards Inc.**)* *(November 22, 2023)*
  - Engineered a **multi-wavelength** image processing method to automate annotation tasks, **reducing manual efforts**
  - Created a customizable **GUI for ROI mask extraction**, image segmentation, & object **processing with excel data**
  - Proposed a novel method to **annotate images of a object** taken at **different wavelengths** with related information
- **Deep Learning-Based Track Prediction and Correction for a Radar Target**
  *(Published in IEEE Transactions on Radar Systems'23, Collaborator: **Bharat Electronics Limited**)* *(March 17, 2023)*
  - Developed a **TCN-based system** that surpasses traditional **IMM-based Kalman filters** in predicting object track
  - Achieved **60% improvement in radar accuracy** for tracking highly maneuvering 3D targets in the **military vicinity**
  - Created a **MATLAB-based simulation** to generate **training data**, which was later processed by **Python AI models**
- **The Smart Authenticated Fast Exams (SAFE) IIT Bombay App: Best Initiative Award**
  (Awarded by IIT Bombay Director during Orientation Day '23) *(August 3, 2023)*
  - Developer of **SAFE**, a platform used by numerous **professors** for conducting **attendance** and **quizzes** in lectures
  - Supported **100+ professors** and onboarded **1000+ students** for smooth usage both within & **outside IITB** premises
  - Invited by the **Application Software Centre (ASC)** to integrate SAFE into **IITB portal** for all UG and PG courses

MAJOR PROJECTS AND SEMINAR

- **AI-Enhanced Grading System for Smart Authenticated Fast Exams (SAFE)** *(M.Tech Project)* *(Jan'24-till date)*
  - Deployed an OCR model for **keyword highlighting** in answer scripts, achieving **87% accuracy** on our IITB dataset
  - Built a **Batch Grading Interface** using **Vue.js** for efficient evaluation of multiple answers on **Django-based** server
  - Crafted a feature for **grouping similar-looking answers** using **LLM APIs** for assisting professor in their evaluation
- **Survey on AI-Driven Handwritten Exam Assessment** *(M.Tech Seminar)* *(Aug'23-Dec'23)*
  - Performed an in-depth **literature review** on existing **AI solutions** for automating grading of handwritten answers
  - Analyzed **Gradescope**, an American ed-tech competitor, to incorporate **similar functionalities** into our pipelines
  - Evaluated and compared existing solutions to optimize the **SAFE interface** and enhance its functionality using AI
- **Predictive Modeling for Radar Object Tracking and Corrections** *(B.Tech Project)* *(Jan'21-Apr'21)*
  - Tasked with **detecting** an object, **predicting** its track, and **associating** it with a correct label for its future references
  - Applied TensorFlow for **tracking object** in radar, enhancing **trajectory prediction** & object association significantly
  - Integrated **synthetic data** from MATLAB to improve predictive accuracy and **probabilistic forecasting** in vicinity

WORK EXPERIENCE AND INTERNSHIPS

- **A.I Engineer Intern | Exawizards India LLP, Hyderabad** *(Lead: Mr. Nishanth Koganti)* *(Oct'21-Jun'23)*
  - Integrating **AI solutions** that enhance objection detections, demonstrating **practical applications** & improvements
  - Led **R&D** and **client projects**, providing solutions for clients like **NEDO**, covering both modelling & deployment
  - Developed an **Pose tracking** system with Tkinter for monitoring pets' activities, enhancing **caretaking experiences**
  - Created an **Split Autoencoder** for face detection, deploying encoder on **M5stack device** & decoder on Jetson Nano
  - Fine-tuned a **MaskRCNN model** for fruit detection utilizing Kaggle's open source **Fruits-360 dataset** using MMDet
- **Quantitative Analyst Intern | Dolat Capital Market PVT LTD, Mumbai** *(Lead: Mr. Jigar Shah)* *(May'24-Jul'24)*
  - Engineered a **Cash & Carry with Calendar Spreads** strategy for index **arbitrage opportunities**, factoring slippages
  - Simulated strategy performance on **tick-by-tick Nifty data** over six months, analyzing **risk-to-rewards PnL** charts
  - Optimized code to C++ for **live deployment** for automated trades based-on pre-configured **entry & exit** conditions
- **Backend Developer Intern | Wealides Fintech PVT LTD, Bangalore** *(Lead: Mr. Priyesh Gandhi)* *(Aug'23-Dec'23)*
  - Developed an **NLP model** to classify SMS transaction messages and **fetch exact amounts** with credit/debit status
  - Worked on a **Django template** to provide a real-time SIP investment calculator on the website using **REST APIs**
  - Integrated **Gupshup's API in backend** to enhance notifications features within the app for **WhatsApp automation**

- **CRM Data Analytics Specialist Intern | PMaps INC, Mumbai** *(Lead: Mr. Saurabh Rana)* *(Feb'24-Apr'24)*
  - Automated performance analysis using **machine learning** to identify key patterns of **good performing** employees
  - Reduced manual work by **70%** by developing **automated scripts**, leading to a significant increase in team efficiency
  - Presented insights through interactive **Streamlit dashboards**, enhancing decision-making with visual graphflows

POSITIONS OF RESPONSIBILITIES

- **Head Web Coordinator at Institute Placement Team, IIT Bombay** *(Aug'23-Jul'24)*
  - Led the management of the placement **portal for 3K+** students, ensuring **seamless user experience** & functionality
  - Streamlined **company allocations** in PostgreSQL & managed our server, with **Node** backend & **Angular** frontend
  - Directed a team of **10+** developers, overseeing website **feature updates** & bug fixes to enhance platform reliability
- **Android Developer, Research Assistant at SAFE Team, IIT Bombay** *(Aug'22-till date)*
  - Administered the **GitHub repository** for the Android, handling bug fixes, **feature development**, and integrations
  - Enhanced the app to **support exam** functionalities for **Bharat Forge** 300+ employees, including **support for Marathi**
  - Executed Play Store **maintenance updates** and **provided assistance** to the team for resolving SAFE-related queries

COURSE PROJECTS

- **Stamp Detection in Electoral Ballots and Vote Counting Website** *(EE769: Prof Amit Sethi)* *(Mar'24-Apr'24)*
  - **Objective**: Create a End2End system for **real-time vote counting** using ballot **image processing** in offline elections
  - Designed and implemented a **web-based system** using **Flask**, and developed an **Android app** for image capture
  - Reduced **manual efforts** prone to errors by automating vote counting, enhancing efficiency with **real-time updates**
- **Solidity-based Decentralized Fake News Detector App** *(CS765: Prof Vinay Ribeiro)* *(Mar'24-Apr'24)*
  - **Objective**: Create a **decentralized application** (DApp) for **fact-checking news** articles to combat misinformation
  - Designed **smart contracts** to enable users to vote on news truthfulness, and aggregate votes into a **fakeness score**
  - **Automated** the news verification process, **enhancing transparency** and **reliability** in detecting fake informations
- **Unified Content Discovery and Custom Playlist Sharing Platform** *(CS699: Prof Bhaskaran Raman)* *(Oct'22-Nov'22)*
  - **Objective**: To develop a webapp that allows users to **discover content** across platforms & create **public playlists**
  - Integrated **TMDb APIs** for searching movies and TV shows, allowing users to **create**, **manage**, and share playlists
  - Built the app using **Django**, enabled **playlist viewing**, **movie descriptions** and identification of streaming services
- **Part-of-Speech Tagging Using Word2Vec and Neural Network** *(CS772: Prof Pushpak Bhattacharya)* *(Mar'23-Apr'23)*
  - **Objective**: Aim to create an efficient DL model for **part-of-speech tagging** by leveraging **BERT** word embeddings
  - Implemented a **Feedforward Neural Network** (FFNN) model, utilizing backpropagation and fold **cross-validation**
  - Achieved **90% accuracy** in POS tagging by using a LSTM-based **encoder-decoder** model on the **Universal Tag Set**
- **Custom Virtual Machine Implementation from scratch** *(CS695: Prof Mythili Vutukuru)* *(Mar'23-Apr'23)*
  - **Objective**: Design and build a secure & efficient **virtual machine** environment to ensure robust protected isolation
  - Implemented the VM using **cgroups** and **namespaces**, integrating **QEMU-KVM hypercalls** for enhanced isolation
  - Achieved robust **system isolation** by improving security and resource management for **virtualized environments**
- **Understanding the Impact of Artificial Intelligence on White Collar Jobs** *(PS643: Prof Anupam Guha)* *(Oct'23-Nov'23)*
  - **Objective**: Investigated the effects of **AI on white-collar jobs** to understand the changes in employment patterns
  - Conducted a **comprehensive survey** and analysis, assessing **global** and **local** data on AI's impact on employment
  - AI will likely **handle repetitive manual tasks** soon, but tasks requiring cognitive thinking will be harder to replace
- **Development of MDP Solvers for Optimal Policy Computation** *(CS747: Prof Shivaram Krishnan)* *(Oct'23-Nov'23)*
  - **Objective**: Compute **optimal policies** for Markov Decision Processes (MDPs) using algorithms in bandit problems
  - Implemented **Value Iteration**, **Policy Iteration**, and **Linear Programming** for a football team scenario application
  - Enabled effective computation for decision-making and **improving strategic planning** in real practical problems

TECHNICAL SKILLS

- **Programming/Scripting Languages**: Python, C/C++, Java, JavaScript, MATLAB, PHP, SQL, Git, Docker, LaTeX & Bash
- **Tools and Platforms**: Android Studios, PostgreSQL, AWS, Django, Linux, Keras, OpenCV, NodeJs, VueJs and VS Code

MAJOR COURSES TAKEN

EE769 Introduction to Machine Learning (ML)
PS643 Introduction to AI, Data, and Policy (Institute)
CS747 Foundations of Intelligent & Learning Agents
CS6003 Web Security and **CS675** Computer Graphics
CS744 Design and Engineering of Computing Systems
CS695 Topics in Virtualizations and Cloud Computing
CS772 Deep Learning for Natural Language Processing
CS765 Blockchain, Cryptocurrencies & Smart Contracts

EXTRACURRICULAR ACTIVITIES

- Part-time trader and investor, **managing family portfolios**, IPO applications, and speculative investments in the market
- Completed **ISRO's Space Science & Technology training** *('23)* and participated in **Smart India Hackathon** (SIH) *('20)*
- Cleared **JEE Advanced**, qualifying for admission to IIT among over 2M+ students in competitive general category *('18)*
- Keenly interested in **space science**, quantum computing, cryptography, puzzles, sports, startups and **financial markets**