Rushi Chavda

Indian Institute of Technology, Bombay (2020-25)

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Minor Degree in **Data Science and Artificial Intelligence** from Centre of Machine Intelligence and Data Science, IIT Bombay

PUBLICATIONS

Classification of Diagnosed Social Media Text Related to Disease Using BERT and LightGBM *['23]*

Chavda R**.**, Makwana D., Patel V., Shukla A. | *Awarded **Letter of Recommendation** from **Director of NIT, Surat** for *AI research acumen*
- Prestigious **AMIA 23rd Annual Symposium, USA** accepted and featured my peer-reviewed full paper as one of top presentations
- Pioneered **top-performing** NLP model in Social Media Mining for Health - 2023 (SMM4H-23) shared task, set new field benchmark
- Achieved exceptional performance of **0.94 F1 Score** by conceptualizing fine-tuned BERT embedding with LightGBM model pipeline

Continuous Emotional State Modelling | Human Computer Interaction *['23 -'24]*

Chavda R., Pandey S., Upadhyay A. | *Full length paper under peer-review in the **Proceedings of National Academy of Science, USA***
- Regressively predicted accurate human emotional state, using 9 physiological signals, derived key input features using **Neurokit lib**
- Achieved Avg. **RMSE of 1.33** across different generalizing test data scenario on **Decision Tree Regressor** model with early stopping

WORK EXPERIENCE

NavaInsight | Applied AI Scientist *[Oct'25 - Present]*
- Lead end-to-end development and scaling of an **AI-powered value-investment platform** for hedge funds, covering architecture, backend systems, data pipelines, and production-grade model deployment.
- Build advanced AI systems including **Graph RAG and Hybrid RAG** pipelines, knowledge graphs, and GNN-based modelling to extract, represent, and reason over complex financial data for high-accuracy investment insights.
- **Fine-tune** and integrate LLMs on proprietary financial datasets to power research, analysis, and decision-support workflows, optimizing accuracy, latency, and cost of inference in production.
- Own **full-stack** implementation of platform features, from API design and distributed backend services to cloud infrastructure, vector search, and workflows enabling continuous scaling.

Nexus Cognitive Technologies | Product Engineer *[Jul'25 – Oct'25]*
- Working in Product Engineering Team, that is responsible for Research and Development for new tools and features in our products, my role is to RnD new tools and features related to AI, Automation, data engineering, data science, & data analytics in our products.

INTERNSHIP EXPERIENCES

IBM AI Research | Research Internship | Target outcome: Full length Publication *[Jun'24 – Nov'24]*

*Prestigious **American Geophysical Union (AGU)**, United States of America, My First authored full abstract is under the peer review*
- Introduced **novel** soil moisture estimation, using satellite images by fine-tuning the **Prithvi-100, GFM** (Geospatial Foundation Model)
- Compiled and processed dataset of **3 yrs** of satellite images of **40 soil sensors'** data of Texas regions with **Rasterio** and **Geedim** library
- Achieved a test **MAE of 0.0357, RMSE of 0.055** in the moisture prediction with **U-Net** as baseline model using custom loss function

Harvard University | Gen AI for Hardware | *Awarded **LOR** from **Head Prof** for exemplary performance* *[May'24 - Jul'24]*
- Developed pipeline to automatically annotate dataset for hardware research corpus **(200mn tokens)** using few-shot LLM evaluation
- Optimized evaluation parameters by formulating custom task in **YAML framework**, and seamlessly integrated evaluation pipeline
- Achieved a **94% F1-Score,** by Implementing the cutting-edge LLM models, including **GPT - 4, GPT - 4o, Llama3 - 8b** and **Mistral - 7b**

Reliance JIO | Computer Vision Intern *[Jun'22 - Aug'22]*
- Deployed AI-based smart technology to ensure **perimeter security** measures of venue for large-scale event, worked in a team of 2
- Implemented **Number plate recognition system** using the video feed of vehicle number plates from the entrance of the parking
- Enhanced **accuracy to 84%** and reduced character error rate by utilizing advanced image processing techniques to limit motion blur

Ernst & Youngs (EY) | Gen AI Intern *[Jun'23 - Aug'23]*
- Developed the proof of concept for **Automatic ESG Reporting** using fine-tuned LLM, that assist the client in speeding up reporting
- Reduced the LLM cloud hosting cost to **45%** using **Low-rank Adaptation** fine tuning framework, with equivalent response quality
- Achieved a **86% BERTScore** and **81%** correctness in responses compared to gold standards, leading to a reduction in human hours

Birlasoft | NLP Intern *[Jul'23 - Nov'23]*
- Developed robust proof of concept for the company's internal chatbot, with motivation to enhancing employees' decision-making
- Deployed **LLaMA 8B** model, implemented **Retrieval Augmented Generative (RAG)** pipeline to fetch relevant answer from data
- Leveraged **LoRA** (Low Rank Adaptation) Framework to fine tune **LLaMA 13B** using less compute and storage, reduced cost by **29%**

Aavas Financier | Data Science Intern *[May'23 - Jun'23]*
- Implemented **XGBoost** model to estimate next 2 months' loan disbursement amount, using the last 24 months' disbursement data
- Achieved **0.82 R-Square** error, by incorporating weather, inflation, macroeconomic factors' and company employees' data to input

DR Choksey Finserv | Analyst Intern *[Nov'21 - Dec'21]*
- Generated a **79% ROI** on a suggested INR 3M+ portfolio with only 7% downside over two years, earning LOR for investment acumen
- Developed a financial model to filter and recommended 11 high-performing stocks, contributed to internal equity research report

INTERNSHIP EXPERIENCES - STARTUPS

Genyx | Lead AI Engineer *[May'25 - Aug'25]*
- Designed a rule-based nutritional scoring system using user profiles (weight, height, health goals) and macro/micronutrient data.
- Built a word embedding–based semantic ranking system to match and rank food items by dietary relevance and context.

- Architected AI-powered quiz generation system supporting 8 novel question formats on wellness topics from simple topic inputs.
- Developed and integrated Flutter .dart components for quiz, food rating, and ranking systems with full frontend UX flows.
- Configured and integrated Firebase for app-level user analytics, enabling event tracking and deployment monitoring.

Augmen.io | AI Engineer Intern *[Jun'25 - Jul'25]*
- Built multimodal driver monitoring system (**0.91 F1**) for horn and drowsiness detection, robust to low-res video and noisy audio.
- Fine-tuned TTS model on 30 mins of data to achieve accurate voice cloning; reduced latency to **200ms** for 15-word inputs.
- Optimized real-time video-audio analytics for **edge deployment**, ensuring high accuracy and low latency under constrained setting.

IntelEhealth | NLP Intern *[Jun'23 - Nov'23]*
- Built an **AI medical assistance system** using medical books, can suggest diagnose to patients, implemented on Gradio user interface
- Reduced cost by **31%**, by utilizing **LoRA** (Low Rank Adaptation) Framework to fine tune **LLaMA 13B** using less compute and storage
- Improved correctness to **76%, BERTScore 87%,** reduce response time by **39%**, by using **Langchain Agent** with **GPT-3.5-turbo** APIs

Region Infinity | AI Intern *[Feb'25 - Mar'25]*
- Built a **Streamlit**-based app to convert **LaTeX** math solutions into detailed stepwise JSON with dynamic quiz questions.
- Resolved long-context handling by fragmenting LaTeX dumps, enabling modular solution generation and smooth JSON aggregation.

BharatGen | Data Science Intern *[Feb'25]*
- Scraped Indic text corpus from diverse sources by building **web crawling** pipelines, storing structured metadata for NLP tasks

Go Dream | AI Developer Intern *[Feb'25 - Mar'25]*
- Built generative pipeline prompting user input for jewelry, clothing, or rugs, generating images with variations via image synthesis.
- Created system to auto-apply AI-generated jewellery/clothing on virtual models, enabling previews through conditional compositing.

TechnoBrain | Data Science Intern *[Jun'22 - Oct'22]*
- Achieved **78% Intersection over union,** in the personalized vegetable recommendation model, improving the customer experience
- Trained **LightGBM** model as recommendation engine, by deriving impactful input features from raw data using statistical data analysis

KEY PROJECTS

InstiGPT – IIT Bombay's Exclusive Chatbot | Lead the AI Team of 8 | Full Stack Project *[Dec'23 - Feb'24]*
- Built a **RAG** (Retrieval Augmented Generative) based chatbot on Institute's web and document data to assist freshmen in queries
- Deployed beta version for the community of **20000+** students & staffs, with quality testing **(Rating 7/10)**, in **3 months** using Gemini

Zero external cost	Response time **~3 sec**	**Live search** enabled	Weekly **Users 6000**	Backend **FastAPI** based **REST API**

Drug Discovery using Generative AI | Course Project *[Jan'24 - Apr'24]*
- Implemented generative models to assess the capabilities to generate drug molecule given its target property, worked in team of 2
- Created streamlined pipeline for converting **SMILE format molecular data** into **graph representations,** inputs for generative models
- Enhanced reconstruction loss by **9%**, by Implementing **VAE** (Variation Auto Encoder) using custom to train on graph molecular data
- Implemented **Conditional GAN** and **Graph GAN** in Pytorch, reported detailed comparative study of generative capabilities of models

Document Question Answering Model | Supervisor: Prof. Asim Tewari | *Received Letter or Recommendation* *[Nov'22 - Dec'22]*
- Designed a novel approach for document-based descriptive question answering using contemporary LLMs for enhanced accuracy
- Implemented similarity filter to provide contextual answers by fetching relevant text using the **BERT** and **Pinecone vector database**
- Achieved correctness **92%, 0.72 BLEU;** Paraphrased responses using **GPT 2.0** model; Integrated the Q and A system with **Gradio UI**
- Enabled option in the user interface to input the expected length of the answer of the question, to ensure customized experience

Building Layout Complexity Prediction | Course Project – Programming for Data Science *[Jan'24 - Apr'24]*
- Applied **K-Means** Clustering to classify based on complexity, by deriving domain adherent **7 salient features** from layout images
- Achieved **0.82 Silhouette Score**, by training **Auto Encoder** Model, got compact representations of layout, sped up layout designing

Inter IIT Tech Competition | IIT Madras | High Preparation Problem Statement *[Nov'23 - Dec'23]*
- Selected to work on a **challenging** NLP Automation related project of by AI firm named **DevRev,** demonstrated results in IIT Madras
- Contributed in Dataset generation by prompting, using DevRev's APIs for seeding the relevant domain, while ensuring the diversity
- Experimented with techniques like **Few Shot Prompting, Chain-of-Thoughts, ReAct**. Applied **Masked Language Fine tuning** of LLM
- Achieved **~64% DAG** match with GPT 3.5, Experimented with LLMs like **Claude, GPT 4, LLaMA, Mistral** using **novel** Planner method

Mortality Prediction of ICU Patient | Course project – Digital Health Informatics *[Jul'23 - Dec'23]*
- Developed a mortality prediction system using patient's clinical notes, medications and reports of 48 hours of ICU admission
- Achieved a remarkable **0.92 AUC** on **Clinical Bigbird** LLM fine tuning, with the specially pre-processed raw medical text notes

Lane Detection in Harsh Situations | Course Project – Computer Vision *[Mar'23 - Apr'23]*
- Built a robust and accurate **lane detection deep learning model** for self-driving cars for harsh and low visibility natural conditions
- Performed video frame **Image Augmentation** to procure data for harsh and low light situations from high quality image data
- Achieved **90%** Intersection over union by enhancing segmentation by training U-Net model with Convolutional Block Attention Module

Flow Shop Scheduling | Course Project – Industrial Engineering and Operational Research *[Jan'23 - Apr'23]*
- Worked in a team of 4 to derive method to optimally schedule the processes in the manufacturing line to reduce time & cost
- Achieved results **90%** close to optimal by implementing scheduling heuristics using a **Genetic Algorithm** on job flow sequence

Facial Expression Recognition | Course Project | Prof. Ramkumar Rajendran, C-MinDS *[Oct'22 - Nov'22]*
- Implemented **Facial Expression Recognition** model to understand Human Computer Interaction to understand learning habit
- Achieved **73% accuracy** in classifying the facial expressions into 7 classes by training **Convolutional Neural Network (CNN)** model

Medical Diagnosis using LLM | Dual Degree Project | Master's Thesis *[Aug'24 – Present]*
- Working with the CEO of IIT Bombay Trust Lab on a impactful research to make **nano LLMs**, that will be specialized in a specific field
- Focused to create medical domain expert Nano scale LLM, that will make LLM cheaper and more accessible for medical Institutions

POSITION OF RESPONSIBILITY

Head Teaching Assistant (TA) | Course – Statistical Machine Learning and Data Mining *[Aug'24 – Present]*
- Working and leading course logistic efforts in a team of 17 TAs, to ensure smooth logistics and teaching assistance to 300+ students
- Responsible for invigilating and checking of lecture quizzes, exams and weekly coding assignments, while ensuring timeline of course

Marketing Coordinator | Techfest-2021, IIT Bombay *[Nov'21 – May'22]*
- Executed a networking session via cellular communication reaching out to **500+** target audience, ensured **40% positive appearance**
- Worked in the Asia's largest Science and Technology festival with footfall of **175000+** Attendees & **280+** exotic events & exhibitions

Activity Associate | National Service Scheme, IIT Bombay *[May'21 – Jun'22]*
- Largest student volunteer organization at IIT Bombay, positively impacting for betterment of life of over 1million people across India
- Executed a ***Best out of Waste*** competition in online setting under the Ministry of Education to promote waste utilization in society
- Responsible for inviting chief guest excellences the flagship event of NSS IIT Bombay (Flare), hosted the full event of **500 attendees+**

SCHOLASTIC ACHIVEMENTS

- Achieved an outstanding **99.80 percentile** in Gujarat's Class 10th state exam, significantly surpassing over 1 million candidates *['18]*
- Achieved an outstanding **99.52 percentile** in **GUJCET** (Gujarat Common Entrance Test), surpassing over 0.15 million candidates *['20]*
- JEE Advanced **All India Rank 926th** out of 0.2 million+ candidates | JEE Mains **99.59 percentile** among 1 million+ candidates *['20]*

EXTRACURRICULER ACTIVITIES

PR Team Lead (2015-Present)	• Maintaining public relations and participating in **BAPS Swaminarayan Sanstha** run Socio-Spiritual Activities • Hosting ministers, CEOs, businessman's, celebrities, social workers, bureaucrats to temple visit and events
Exhibition Coordinator (Dec'2022)	• Volunteered at BAPS' Pramukh Swami Maharaj's centenary, a 30 days event in 600 acres, footfall of 12.1 m • Responsible to coordinate with 20+ large events and exhibition to ensure smooth experience of VIP guests • **0.2 million** VIPs | Avg. Daily Footfall of **0.4 million** from **56+ countries** | **80,000+** volunteers from globe
SKILLS / TOOLS	• Python, SQL, Pytorch, Tensorflow, Statistics, Data Analysis and Visualization, Basic Azure AI, Apache Spark, Basic R, MATLAB, Basic IBM Cognos, Docker, Linux, GitHub
KEY COURSES	• Statistical Machine Learning and Data Mining, Advanced Topics in Machine Learning, Image Processing, Programming for Data Science, Computer Vision, Learning Analytics and Educational Data Mining, Advanced Machine Learning, Foundations of Intelligent and Learning Agents