Mihir Pamnani

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https://mihir3.github.io/portfolio/

EDUCATION

University of Illinois, Urbana-Champaign **January 2024 - May 2025**
Master's in Computer Science **Graduate Student**
Relevant Coursework: Applied Machine Learning, Deep Learning for Computer Vision, Machine Learning and Data Systems

University of Mumbai (VESIT), India **August 2019 - July 2023**
Bachelor of Engineering in Computer Engineering **(CGPA: 9.83/10)**
Relevant Coursework: (Data Warehousing and Mining, Database Management Systems, Big Data Analytics), (Applied Mathematics, Machine Learning, Natural Language Processing), (Data Structures and Algorithms, Distributed Computing)

TECHNICAL SKILLS

- Languages: Python, Java, JavaScript
- Libraries/Frameworks: Node, React, React Native, Pytorch, Flask, Data Science Libraries (NumPy, Pandas, Scikit-learn, Matplotlib, NLTK, Stanza, Transformers)
- Databases: SQL, MongoDB, Hadoop (HDFS, MapReduce, Hive)
- Tools: Git, Docker, Tableau, CERN Root

PROFESSIONAL EXPERIENCE

Tata Institute of Fundamental Research (CERN Collaboration) **August 2022 - July 2023**
Research Assistant
- Automated the manual QA framework for printed circuit boards in the CMS experiment at CERN, with object detection and segmentation using **YOLOv5s and Hough Transform** algorithms for defect detection.
- Developed anomaly reports utilizing CERN's Root framework and deployed QA framework, identifying manufacturing defects **within a few seconds** via local Flask instance. [Paper under review for JINST (1748-0221)]

National Institute of Technology, Kurukshetra **August 2022 - February 2023**
Research Intern
- Built Jud-IPL **dataset of 43k annotated legal case documents** using a spaCy pipeline and custom regular expressions.
- Conducted experiments for legal judgment prediction using domain-specific embeddings on classical and transformer models such as **BERT, RoBERTA, and XLNET**.
- Led a team of four students and designed alternative experiments for legal judgment prediction using rhetorical roles and summarization. [Paper under review at KDD 2024]

Atto Infotech **January 2022 - July 2022**
Software Engineer Intern
- Built full-stack components in **React** for web applications for Edtech clients**,** using a MySQL database in the backend.
- Developed trend forecasting reports for clients using time-series models, **KMeans clustering, and Apriori association algorithms** to deliver valuable insights.

ACADEMIC PROJECTS AND PAPERS

KhakiMitra: Speech Emotion Recognition on Live Emergency Calls [Report]
- Developed a synthetic **dataset of 400 Hindi call recordings** to predict an emergency caller's state of influence using **feature-engineered Mel-spectrograms** of call recordings and **extracted keywords** from call transcripts.
- Won the National Smart India Hackathon - 2022 under the problem statement, by predicting emotions with a **65% accuracy** and deploying the project on a dashboard using React-Firebase system with Twilio Voice API, for emergency responses.

DOT-HAZMAT (Detection Of Threat: Hazardous Materials) [Paper] [Code]
- Built a customized Convolutional Neural Network pipeline-based **Android application using Pytorch and Tensorflow Lite** for real-time detection of 13 HAZMAT signs with a **precision rate of 98.77%** at accident sites.
- Presented a research paper on our work at ICIRTE 2022 with pre-print in Elsevier's SSRN(1556-5068).
- The paper was one of the Top 10 papers under 'CompSciRN: Other Applied Computing' in August 2022.

EXTRA-CURRICULAR ACTIVITIES

- **Led the Web Development team** at CodeCell, VESIT organizing the annual Syrus 2023 Hackathon and organized open-source workshops for 50+ freshmen students on Git and Version Control. (2020-23)
- Organized many literary events, such as with Union Bank of India, to hold discussions on corruption laws, etc. as the **Head of the Model United Nations (MUN) Division** at VES Literature Council. (2020-22)
- Worked as the **Junior Reporter** at VESIT's monthly newsletter, ' VESIT Connect' where I contributed articles by writing about college events. (2019-21)