Mansi Dhamne

+91 9930241703 | mansiadhamne@gmail.com | linkedin.com/in/mansi-dhamne | github.com/mansidhamne

Education

Bachelor of Technology in Computer Engineering 2022 – 2026
Sardar Patel Institute of Technology, Minor in Finance and Management *CGPA: 9.63/10*

Research Experience

Purdue University May 2025 – Aug 2025
Research Fellow, SURF *Indiana, USA*

- Designed *Health Persona™*, a HIPAA-compliant iOS platform for **continuous, multimodal** monitoring of Hypermobile Ehlers-Danlos Syndrome (hEDS), integrating speech, text, and wearable physiological data.
- Fine-tuned **OpenAI's Whisper** ASR model on medical consultations, reducing Word Error Rate from 35.6% to **8.96%**, enabling high-fidelity transcription for downstream correlation analysis.
- Developed an analysis engine that integrates **NER** on symptom notes, **multivariate time-series analysis** of wearable data, and **association rule mining** to model symptom–activity correlations and predict potential flare-up triggers, enabling data-driven clinical decision support.
- Integrated a **Retrieval-Augmented Generation** powered chatbot to enable safe, context-aware Q&A, clinician-patient consultation summaries, and proactive health alerts based on real-time data.

Indian Institute of Technology, Bombay January 2025 – Present
Research Intern, IRCC Awards *Mumbai, Maharashtra*

- Investigated prosodic boundary prediction to enhance oral reading fluency and child-directed Text-to-Speech (TTS) systems, focusing on how pause placement affects naturalness and comprehension.
- Curated and annotated a dataset of 54 leveled English stories (8,600+ words) with pause boundaries marked by 21 raters & achieved substantial inter-annotator agreement ($\kappa = 0.68$).
- Engineered linguistic + breath-based features and trained **LightGBM** models achieving $\mathbf{R^2}$**=0.87**, F1=0.89 for pause boundary prediction.

Publications & Conferences

Mansi Dhamne, Sneha Raman, Preeti Rao. **Predicting Prosodic Boundaries for Children's Texts**, EMNLP 2025; (Oral);
Mansi Dhamne, Vivek Gangwani, Swapnali Kurhade. **Robust and Interpretable Multimodal Fusion in Med-VQA: A Perturbation Benchmark for Clinical Safety**, AAAI 2026 Workshop SECUREAI4H.
Mansi Dhamne, S. Steinhubl, Matthew P. Ward. **Health Persona™: Multimodal Monitoring Platform for hEDS**", Poster at AHA BCVS 2025; Oral at Purdue Summer Research Symposium 2025.

Work Experience

Teaching Assistant Jul 2025 – Present
Artificial Intelligence and Soft Computing (CE303)

- Designed course assignments and evaluated student submissions, providing constructive feedback.
- Collaborated with faculty on research-driven course enhancements, strengthening expertise in academic mentorship.

Software Development Engineer Intern Aug 2024 – Oct 2024
Procura Business Pvt. Ltd. *Mumbai, India*

- Automated bill scanning and data extraction using **Python (Tesseract OCR, spaCy NER)**, reducing manual documentation effort for a 15-member operations team.
- Redesigned the company's main website with **Next.js**, improving visual design, responsiveness, and accessibility—boosting **lead generation by 50%** and reducing **bounce rate by 25%**
- Developed an order and quotation management dashboard enabling interactive data visualization and optimized product recommendations for over 2,000 SKUs.

Software Development Engineer Intern Jun 2024 – Jul 2024
Advance Mobility Pvt. Ltd. *Mumbai, India*

- Developed a **Blacklisting & Fraud Detection Module** (**NestJS, PostgreSQL**) identifying unauthorized drivers via document mismatches, repeated cancellations, and geolocation anomalies—enhancing operational security.
- Maintained and optimized the company website (**Next.js, Tailwind CSS**), providing cross-functional support across 7 departments for system stability and seamless data flow.

Projects

Robust and Interpretable Multimodal Fusion in Med-VQA | Sept 2025 – Oct 2025

- Benchmarked lightweight fusion architectures for **Med-VQA** across **VQA-RAD, SLAKE, and PathVQA** datasets, analyzing interpretability and robustness.
- Introduced **additive** and **cross-modal gating** modules that reduced model parameters by **6.1**x while maintaining **41.4% accuracy** in open-ended generation.

Pharma-Bridge | Mar 2025 - Apr 2025

- Built a **full-stack healthcare platform** with secure multi-agent pipelines for real-time medication matching, drug interaction checks (MedLLaMA2), and structured radiology reporting.
- Developed **OCR (PaddleOCRX + OpenCV)** and **LLM-based** pipelines (Gemini Pro, BART-Large-CNN) for automated report extraction, summarization, and symptom transcription (**WER 9.9%**).

Cyber.AI | Oct 2024 - Dec 2024

- Enhanced a **Retrieval-Augmented Generation (RAG)** framework by integrating external **Feature Vector Clustering** for document-level grouping, improving contextual retrieval.
- Analyzed company compliance and infrastructure documents using **NER** and **LDA topic modeling** to detect missing or weak mentions of security controls (e.g., firewalls, auditing rules, data encryption).
- Developed a **risk-aware assessment bot** using **Chain-of-Thought prompting** to dynamically question gaps in compliance, generating actionable insights on potential data breach and network security risks.

Intelligent Driver Assistance System | Mar 2024 - May 2024

- Engineered a real-time, multi-layered driver assistance system to mitigate high false alarm rates by cross-validating **driver fatigue** (via Dlib) with **vehicle lane departure** (via OpenCV).
- Implemented a dual-module system by (1) **tracking facial landmarks**, and (2) building a **lane detection pipeline** using HLS color-space, perspective warping, and a sliding-window polynomial fit.
- Achieved **94.10% lane detection accuracy** on highways with clear markings and validated the integrated system's reliability through real-world testing on **proprietary dataset of Indian roads**.

Achievements

IBM Maitreyee 2025 Research Showcase Winner: Recognized among 200+ applicants for outstanding research and invited to present work to IBM's research community.
Amazon ML Summer School, 2024: Got selected in the top 3% amongst 90000+ participants
Certificate of Excellence: Awarded for outstanding academic performance, securing 1st place (/200) in the First Year
First Prize at DataHack 3.0 Hackathon: Implemented a Cybersecurity Risk Assessment Bot called Cyber.AI
First Runner Up at Technovate 2.0: Implemented a streamlined search algorithm to build a recommendation engine.
First Prize at S.P.I.T SE Hackathon: Developed PeerConnect leveraging Next.js, Gemini API and MongoDB.
Top 10 at LOC Hackathon: Implemented a novel OCR to facilitate reimbursement and detect fraud.

Extra Curriculum

Creatives Lead | *Google Developer Students Club* Jul 2023 – Jun 2024

- Designed visual content (banners, posts, videos) for events and organized tech workshops reaching 200+ students, while mentoring junior students.

Joint Secretary | *Rotaract Club of S.P.I.T* Jul 2023 – Jun 2024

- Led organization of the S.P.I.T Marathon for Mental Health Awareness, attracting 1,000+ runners, and managed overall event coordination and club growth initiatives.

Skills

Languages, Database: Python, C/C++, TypeScript, SQL (PostgreSQL), MongoDB
Frameworks: React, Next.js, Tailwind CSS, NestJS, FastAPI, Swift
ML & NLP: TensorFlow, PyTorch, Hugging Face, spaCy, RAG, LangChain
Developer Tools: Git, Docker, Google Cloud Platform, Vercel, CUDA, VSCode

Certifications

Advanced Learning Algorithms: Andrew Ng Machine Learning Specialization, Coursera
Unsupervised Learning, Recommenders, Reinforcement Learning: Andrew Ng Machine Learning Specialization, Coursera
The Complete Python Bootcamp From Zero to Hero in Python: Jose Portilla, Udemy