Charulkumar Chodvadiya

+917600005609 — charulpatel2499@gmail.com — /in/charulp2499 — /charulp2499 — Google Scholar — Portfolio

AI Engineer with over 3 years of experience, including 2 years in computer vision and AI research. Having a strong foundation in machine learning, deep learning, image processing, and generative models, with published work in top-rated conferences and collaborative hands-on research work with ***IIT Bombay and IIT Hyderabad***.

Skills

Languages: Python, R, C/C++, MATLAB, LaTeX, SQL.
Domains: Artificial Intelligence, Machine Learning, Computer Vision, Pattern Recognition, Image Processing, Generative AI, Multimodal Learning, Time Series Analysis, Medical & Satellite Imaging, MLOps.
Tools & Libraries: PyTorch, TensorFlow, OpenCV, Detectron2, MMDetection, NumPy, Pandas, Matplotlib, Seaborn, Hugging Face, TensorRT, Roboflow, Label Studio, CVAT, FastAPI, GitHub, GitLab, Docker, MLflow, AWS, Azure, Power BI.
Algorithms: CNN, LSTM, Transformer, GANs, Auto Encoder, Contrastive Learning, Anomaly Detection.
Concepts: Transfer Learning, Federated Learning, Object Detection & Segmentation, Statistical Analysis, Data Structure and Algorithms, Cloud Computing, NLP, CI/CD, Data Augmentation, Agentic AI.
Soft Skills: Research, Leadership, Problem Solving, Collaboration, Communication

Experience

AI Engineer **Jan 2025 – Current**
HubBroker ApS

- Fine-tune and deploy Large Language Models (LLMs) and Vision-Language Models (VLMs) for multilingual document data extraction and quality classification across diverse business document types.
- Design and deploy AI-powered APIs with FastAPI, enabling seamless integration into production workflows for enhanced automation.

AI Research Intern **Jun 2023 – Apr 2024**
Visual learning and Intelligence Lab (IITH)

- Researched brain tumor segmentation using federated learning across decentralized medical imaging datasets.
- Proposed and implemented a contrastive learning-based local training loss to mitigate data heterogeneity across multiple clients, achieving a 5–12% improvement in segmentation accuracy.

Teaching Assistant (Research) **Sep 2022 – May 2023**
Pandit Deendayal Energy University

- Conducted research in machine learning, statistical data modeling, and computer vision. Key projects included solar power forecasting and maintenance prediction, night vision face detection, and palm print identification.
- Authored or co-authored 5 or more publications, showcasing active involvement and contributions to the field.

Python Developer Intern **Aug 2020 – Mar 2021**
Odoo India

- Contributed to the development and maintenance of backend services within the Odoo ERP ecosystem.
- Built a full-stack alumni portal as part of the B.E. final year project using Python, PostgreSQL, JavaScript, and Bootstrap.

Research Collaboration

AI Researcher
Koita Center of Digital Health (IITB)

- Participated in diverse medical Al projects, including medical imaging and EEG signal analysis Authored publications and contributed to peer-review processes for other fellow researchers' work.
- Developed a novel loss function for enhancing medical image segmentation accuracy by 6-8%, leading to a publication at A-tier conference - ISBI24.

Education

Masters in Technology - Artificial Intelligence **Pandit Deendayal Energy University**
(Gold Medalist) **(CGPA: 8.94 / 10.00)** **Aug 2022 – May 2024**

Relevant Coursework: Computer Vision, Deep Neural Networks, Machine Learning, Time Series Data Analysis, Pattern Recognition and Machine Learning, Explainable AI, NLP, Cloud Infrastructure for AI

Bachelor of Engineering - Computer Engineering **Gujarat Technological University**
(First Class with Distinction) **(CPI: 7.95 / 10.00)** **Jul 2017 – Jun 2021**

Projects

SynthAI: Interactive Generative Image Sandbox **Live Space**

– Building an interactive platform for users to generate images using various GAN architectures, allowing exploration and comparison of different generative models.

EmoSense: Real-Time Facial Emotion Recognition **Live Space**

– Developed a real-time facial emotion recognition application using Streamlit, OpenCV, and FER, enabling emotion detection from static images and live camera feeds with visual overlays.
– Achieved 88-95% accuracy on the FER2013 dataset, delivering robust performance for seven emotion classes in diverse lighting conditions.

PalmScanX: Smart Biometric Authentication Using Palm Prints **Code**

– Created a proprietary palm print dataset with 3600+ annotated images, applying noise removal, kernel filtering, and transfer learning with YOLOv5 and YOLOv8 for palm-print biometric authentication.

LumiFace: Low-Light Face Detection using Thermal Imaging

– Built a face detection module for low-light conditions using Haar-cascade, Dlib, and YOLOv8, integrating thermal imaging to enhance performance in challenging environments.
– Increased detection accuracy by 15-22% (mAP) over baseline models, achieving reliable face detection in near-dark settings for security applications.

SunSentry: Time Series Solar Power Forecasting and Maintenance Prediction

– Performed data preparation on a noisy 3–5-year PDEU solar power plant dataset with human comments, cleaning data and extracting features from human comments, and implemented machine learning, deep learning, and statistical models to predict power output and over 18 maintenance activities.
– Achieved 85 - 90% forecasting accuracy and reduced plant downtime through anomaly detection for maintenance tasks.

Publications

– **C. Chodvadiya**, N Mahla, KG Singh, and KS Jadhav, "FESS Loss: Feature-Enhanced Spatial Segmentation Loss for Optimizing Medical Image Analysis," 2024 IEEE International Symposium on Biomedical Imaging (ISBI). [Link]
– **C. Chodvadiya**, V. Solanki, and KG Singh, "Intelligent Virtual Worlds: A Survey of the Role of AI in the Metaverse," 2024 3rd International Conference for Innovation in Technology (INOCON). [Link]
– SK Gaurav, **C. Chodvadiya**, B Chintan, S Pooja, and A Bruno, "Seeing in the Dark: A Different Approach to Night Vision Face Detection with Thermal IR Images," (2023) In CEUR WORKSHOP PROCEEDINGS, CEUR-WS under AIxIA. [Best Practical Paper] [Link]
– **C. Chodvadiya**, KG Singh, and R Vyas, "Detection of palmprint from contactless smartphone-based video hand dataset." National Conference on Computer Vision, Pattern Recognition, Image Processing, and Graphics. Singapore: Springer Nature Singapore, 2023. [Link]
– KG Singh, **C. Chodvadiya**, S Vyas, H Patel, S Mishra, and B Tripathi, "Prediction of Solar Power Generation and Maintenance Activities for 1MW Power Plant," 2023 IEEE IAS Global Conference on Emerging Technologies (GlobConET), 2023. [Link]

Certifications

– AI Strategy Foundations for Data Scientists and Team Leaders
– AI Product Foundations: Planning Strategies for Data Scientists
– Career Essentials in Generative AI by Microsoft and LinkedIn

Extracurricular Activities

– Mentored Master's and Bachelor's students in their projects, research, hackathon, and more.
– Founder and Chairperson, Nexero AI Community, and Chairperson, IEEE CIS Student Branch, PDEU, leading 75+ members in tech initiatives.
– Delivered a talk on "Applications of Computer Vision in Real-World Scenarios" at PDEU
– Organizer and Host of Tech Podcast Series: Think Tech Show