

Sneha Patel

Computer Vision | Machine Learning | IoT Systems | B.Tech CSE

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ABOUT ME

I am a third-year CSE student at Navrachana University interested in building AI systems that work in the real world. I like working on problems that combine multiple technologies together, whether it is a deepfake detector that reached **97.5% accuracy** using a mix of vision transformers and image analysis techniques, or a waste segregation system that uses computer vision and IoT hardware. I have completed internships in ML and data analytics, hold certifications from AWS, GCP, Cisco, IBM and Neo4j, and enjoy learning by actually building things.

PROJECTS

DeepShield AI - Deepfake Detection | PyTorch, ViT, FastAPI, Next.js, OpenCV (97.5% accuracy on test data)

- Built a deepfake detection system that combines four different methods: Vision Transformer, Error Level Analysis, DCT frequency analysis and HSV colour statistics. Each method checks for different signs of manipulation so the system does not rely on just one approach.
- The combined model reached 97.5% accuracy on images it had never seen before, which is better than any single method alone.
- Also added Grad-CAM heatmaps so users can see which parts of the image the model flagged, and FGSM-based noise to make original images harder to deepfake.
- Built a full web app for it: FastAPI backend handling the model inference and a Next.js frontend with drag-and-drop image upload.

Local Vegetable Variety Classifier | PyTorch, ResNet18, Custom CNNs, Flask (6 CNN architectures compared)

- Wanted to understand which CNN architecture works best for fine-grained image classification, so I built and tested six different designs: DeepCNN, DepthwiseCNN, GAP-CNN, Multiscale, Residual, and a fine-tuned ResNet18.
- Wrote a preprocessing pipeline to remove backgrounds, balance classes, and augment images to handle noisy photos taken in varied lighting.
- Packaged the best model into a Flask web app where you can upload a photo and get the predicted vegetable variety.

Smart Waste Segregation System | YOLO, OpenCV, Python, Arduino, Raspberry Pi

- Building a smart bin prototype that uses a camera and YOLO object detection to classify waste into four categories: biodegradable, recyclable, hazardous, and non-biodegradable.
- The Raspberry Pi runs the detection model and controls servo motors to physically sort the waste. Ultrasonic sensors monitor bin fill levels.

Real-Time Health Monitoring System | Python, Fitbit API, Scikit-learn

- Building a health monitoring tool that reads live data from a Fitbit Versa 2: heart rate, calories, activity level, and step count.
- Training an ML model on this data to spot unusual patterns and send an alert if readings look critical.

AI Supplier Ranking Agent | Python, Regression Models, Ranking Algorithms (Hackathon, noted by CEO of Mesh Works)

- Built a tool that scores and ranks suppliers automatically using regression-based scoring and a verification algorithm.
- Presented at a hackathon where the CEO of Mesh Works appreciated the approach and practical thinking behind the ranking logic.

Suicide Risk Prediction | Python, Scikit-learn, Neo4j, NLP

- Built this during my internship at CSRBOX. The model looks at behavioural and sentiment data to predict suicide risk levels.
- Used Neo4j to map relationships between data points that were not obvious in tabular form, which improved the model's pattern detection.

Other projects: Financial Sentiment Analysis (TF-IDF + Logistic Regression on financial news) | LeadShift Lead Generation Platform (Python automation for mutual fund distributors) | BakeMyDay Online Bakery System (Java, JDBC, MySQL, JSP) | IoT Automation setups (Arduino, PIR and HC-SR04 sensors, servo motors)

EXPERIENCE

Data Specialist - Internship CSRBOX	Jan 2024 - Mar 2024
- Built an ML model to predict suicide risk from behavioural and sentiment data using Python, Scikit-learn and NLP techniques. - Used Neo4j graph analysis to find hidden connections in the data that improved how the model detected risk patterns. - Wrote detailed reports of the findings and presented them to the team for public health use.	
Machine Learning Intern Brainy Beam Technologies, Ahmedabad	Jun 2023 - Aug 2023
- Built a car recommendation system that suggests vehicles based on what a customer is looking for and their past preferences. - Applied predictive analytics and feature engineering, and wrote progress reports for the management team.	

EDUCATION

B.Tech - Computer Science Engineering Navrachana University, Vadodara	Jul 2024 - May 2027	CGPA 8.57
Diploma - Computer Engineering Govt. Polytechnic for Girls, Ahmedabad	Sep 2021 - 2024	CGPA 9.42 SPI 10 in final sem

SKILLS

AI and ML	PyTorch, TensorFlow, Keras, Scikit-learn, HuggingFace Transformers, YOLO, Vision Transformers, CNNs (ResNet, MobileNet, custom architectures), FGSM, Grad-CAM
Computer Vision and NLP	OpenCV, image preprocessing, TF-IDF, sentiment analysis, anomaly detection, time-series
Data and Databases	Python (Pandas, NumPy), SQL, MongoDB, Neo4j (Certified Professional), Cypher, Matplotlib, Seaborn
IoT and Hardware	Raspberry Pi, Arduino, Fitbit API, HC-SR04 sensors, PIR sensors, servo motors, embedded systems

Web and Backend	FastAPI, Flask, Next.js, TypeScript, Java Servlets, JSP, JDBC, MySQL, REST APIs, HTML, CSS
Languages	Python, Java, C, C++, JavaScript

CERTIFICATIONS

Cloud and AI - AWS Academy - Machine Learning Foundations - GCP Data Engineer Pro: Becoming a Google Cloud Data Engineer - Generative AI Essentials: Using LLMs to Work with Data Data Science - IBM Data Analysis Using Python - IBM Data Analytics Internship Program 2024 to 2025 - Natural Language Processing and Computer Vision	Databases and Emerging Tech - Neo4j Certified Professional - Explore Emerging Tech - IBM SkillsBuild IoT, Security and Management - Introduction to IoT and Digital Transformation - Cisco - Introduction to Cybersecurity - Cisco - Project Management Fundamentals - IBM SkillsBuild - Programming Foundations: Beyond the Fundamentals
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LANGUAGES AND ACHIEVEMENTS

Languages: English (Professional) Hindi (Fluent) Gujarati (Native)	Achievement: WSRO Nationals - Robot Race competitor (programming, hardware, teamwork)
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