

# Shreya Mohan

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## Profile

Engineering student with a strong foundation in Artificial Intelligence and Machine Learning, with hands-on experience in building real-world systems using Python, OpenCV, TensorFlow, and Scikit-learn. Passionate about developing intelligent solutions in areas like computer vision, NLP, and cryptography. Demonstrated ability to lead and collaborate on tech-driven projects, including AI-based drowsiness detection, music-based encryption, and recommendation systems. Experienced in communicating technical concepts effectively through public speaking and team coordination. Eager to contribute to innovative, impact-driven environments that blend research with real-world applications.

## Education

### Bachelor of Engineering (AIML)

RV College of Engineering  
Sep 2023 - Sep 2027

### Relevant Coursework

Data Science for Engineers-NPTEL

## Projects

### Music-Based Encryption System

- Built a novel encryption system that uses audio signals to generate high-entropy AES-256 encryption keys.
- Applied feature extraction on musical data using Librosa and PrettyMIDI to compute Chroma vectors and MFCCs.
- Optimized entropy through nature-inspired algorithms like PSO, GWO, ACO, and SMO for key generation.
- Implemented secure key derivation using SHA-256 and HKDF, with Shamir's Secret Sharing for distributed key access.
- Developed an interactive Streamlit interface for encrypting and decrypting messages using user-generated music.

### Fatigue Detection System Using Drowsiness and Yawn Monitoring

- Built a real-time fatigue detection system using OpenCV and Dlib to monitor eye closure, blinking rate, and yawning via facial landmarks.
- Applied EAR (Eye Aspect Ratio) and MAR (Mouth Aspect Ratio) to detect signs of drowsiness and fatigue accurately.
- Triggered audio alarms and sent automated Telegram alerts to pre-set emergency contacts when fatigue was detected.
- Developed using Python, SciPy, and Pygame with a live annotated video interface and real-time fatigue feedback.
- Potential use cases include factory operator monitoring, transportation safety, and industrial shift work fatigue prevention.

### Small Business Advisor System

- Developed an AI-powered advisory system to support small business owners with personalized recommendations on finance, operations, and marketing.
- Built a rule-based and ML-enhanced logic engine that analyzes user inputs such as business type, budget, and goals to generate actionable suggestions.
- Integrated a user-friendly web interface using Flask and HTML/CSS for seamless interaction.
- Trained on real-world small business datasets and financial guidelines to ensure relevant, data-backed advice.
- Designed to assist entrepreneurs in making informed decisions about resource allocation, market entry, and cost management.

### AI-Powered Eyecare Chatbot

- Developed an LLM-powered chatbot using LangChain and Ollama to assist users with early-stage eye health awareness and diagnostics.
- Integrated visual tests (astigmatism, color blindness, screen-time tracking) and symptom-based questionnaires into an interactive Streamlit UI.
- Designed dynamic prompts for preventive care, improving user engagement and delivering medically-informed guidance without replacing doctors.
- Applied NLP techniques and rule-based logic trained on ophthalmology datasets to ensure safe, relevant, and user-friendly responses.

### Wardrobe Wizard (Outfit Recommender System)

- Built a Flask-based fashion recommendation system that suggests personalized outfit combinations from user-uploaded clothing images.
- Extracted dominant color palettes and feature embeddings using custom NumPy-based ML pipelines for style matching.
- Implemented SQLite and SQLAlchemy backend to manage wardrobe inventory, item metadata, and occasion tags for contextual filtering.
- Developed a scoring algorithm to rank outfit compatibility across tops, bottoms, shoes, and accessories based on user-defined occasions.
- Achieved a scalable, modular design enabling integration with future styling APIs and e-commerce extensions.

### AI Language Translator & Explainer

- Engineered a multilingual translation assistant using LangChain, Hugging Face Transformers, and Streamlit, supporting English, Hindi, French, and Spanish.
- Enabled voice input (STT) and speech output (TTS) via Google Speech Recognition and gTTS for a complete conversational loop.
- Integrated LLM-powered grammar and cultural nuance explanations using prompt chains and LLaMA 3 via Ollama, improving user understanding of language structure.
- Designed session memory with audio playback, enabling a tutor-like experience that combines translation, explanation, and pronunciation.
- Demonstrated modular pipeline architecture using LangChain Runnables for seamless chaining of translation, reasoning, and TTS.

## Hackathons

- Crop Prediction Web App – GenAI Hackathon
- Energy Efficiency Predictor (Chatbot and XGBoost) – BMSCE Hackathon
- Small Business Advisor System – Dayananda Sagar Hackathon
- Interactive Data Dashboard – Remix Hackathon

## Skills

- Languages & Databases: Python, SQL
- Machine Learning: Scikit-learn, XGBoost, TensorFlow, NLTK, Statistical Modeling
- Data & Visualization: Pandas, NumPy, Matplotlib, Seaborn, Power BI
- Core Competencies: Feature Engineering, Data Wrangling, NLP, Applied Cryptography, MLOps, Hypothesis Testing
- Developer Tools: Git, GitHub, Flask, Streamlit