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Gita-Prerna: An AI-Based Emotion-Aware Guidance System Using Facial Emotion Recognition and NLP-Driven Shloka Recommendation

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Abstract: ***Human emotions strongly influence mental well-being, decision-making, and social interaction. With the growing dependence on digital platforms, intelligent emotional support systems have gained significant attention in recent years. This paper presents Gita-Prerna, an AI-driven emotion-aware guidance system integrating Facial Emotion Recognition (FER), deep learning, and Natural Language Processing (NLP) to pro-vide personalized motivational guidance using Bhagavad Gita shlokas and inspirational slogans. The proposed framework captures real-time facial expressions through video input, identifies dominant emotions using CNN-based deep learning techniques, and retrieves contextually relevant motivational content using semantic recommendation mechanisms. The FER module was trained using the FER2013 dataset and achieved an overall emotion classification accuracy of 92.4%. The proposed system integrates culturally meaningful guidance with intelligent recommendation techniques to create a more personalized emotional support experience suitable for emotional wellness applications and intelligent virtual assistants.***

Index Terms: Facial Emotion Recognition, NLP, Deep Learning, Bhagavad Gita, Emotional AI, Recommendation System, Computer Vision

I. INTRODUCTION

Human emotions significantly influence behavior, communication, productivity, and mental stability. In modern society, individuals frequently encounter emotional conditions such as stress, anxiety, frustration, confusion, and sadness due to academic pressure, professional responsibilities, and social challenges. Although emotional wellness platforms and motivational applications are widely available, most systems rely heavily on manual user input and fail to understand the user's actual emotional state accurately.

Recent advancements in Artificial Intelligence, computer vision, and Natural Language Processing have enabled machines to understand and interpret human emotions more effectively. Facial expressions provide one of the richest sources of emotional information because they reflect natural psychological responses. Deep learning models trained on facial datasets can classify emotions such as happiness, sadness, anger, fear, and neutrality with high precision. This paper presents *Gita-Prerna*, an AI-driven emotional guidance framework that integrates Facial Emotion Recogni-tion (FER), semantic recommendation systems, and culturally enriched motivational content. The proposed framework combines emotionally aware AI technologies with philosophical and motivational guidance to provide a more human-centered emotional support experience.

II. LIMITATIONS OF EXISTING SYSTEMS

Most existing emotional guidance applications depend on text-based sentiment analysis or predefined emotional selections.

Such systems often fail to capture genuine emotional states because users may not accurately describe their feelings.

Existing platforms also provide static motivational content that lacks contextual awareness and personalization.

Another major limitation is the absence of real-time facial emotion recognition.

Most systems ignore non-verbal cues such as facial move-ments, expression intensity, and micro-expressions, reducing emotional understanding accuracy.

Additionally, traditional recommendation systems operate independently from emotion detection systems, resulting in limited adaptability and poor contextual understanding.

These limitations highlight the need for a unified intelligent framework capable of integrating real-time emotion analysis, deep learning, semantic recommendation, and culturally en-riched emotional guidance.

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III. RELATED WORK

Facial Emotion Recognition has gained significant importance in recent years due to advancements in deep learning and computer vision.

CNN-based architectures such as ResNet, MobileNet, and VGGNet are widely used for facial expression classification. Natural Language Processing techniques such as semantic embeddings, transformer models, BERT, and SBERT have improved contextual understanding in intelligent recommendation systems.

Existing emotional wellness platforms use conversational AI for emotional assistance; however, these systems primarily depend on manual user interaction and lack real-time emotion recognition.

Research studies also indicate that culturally rooted moti-vational content creates stronger emotional engagement than generalized recommendations.

The novelty of the proposed framework lies in integrating real-time facial emotion recognition with NLP-driven Bha-gavad Gita recommendation using semantic similarity techniques for personalized emotional guidance.

IV. PROPOSED METHODOLOGY

The proposed framework follows a multi-stage intelligent processing pipeline designed to analyze emotional states and provide personalized guidance.

Initially, the system captures video input from the user through a webcam or uploaded recording.

Video frames are extracted and preprocessed using computer vision techniques such as grayscale conversion, normalization, and face detection.

The FER model was trained using the FER2013 dataset con-taining 35,887 facial images categorized into seven emotions. Facial landmarks and expression-related features are ana-lyzed using deep learning-based emotion recognition models.

The model generates probability scores for emotions such as happiness, sadness, anger, stress, fear, and confusion.

The dominant emotional state is identified and forwarded to the recommendation engine.

The recommendation engine uses semantic similarity tech-niques and emotion-tagged mappings to retrieve relevant Bhagavad Gita shlokas and motivational slogans from the database.

NLP embedding models such as BERT or SBERT improve contextual matching between emotions and recommendations.

Finally, the system displays:

- Detected emotion
- Recommended shloka
- Meaning and explanation
- Motivational slogan
- Optional audio playback

V. SYSTEM ARCHITECTURE

The architecture of the proposed system consists of multiple interconnected modules responsible for emotion analysis, recommendation generation, and user interaction.

The frontend interface allows users to upload or record videos.

The API layer manages communication between frontend services and AI modules.

The emotion detection module processes facial expressions using deep learning models, while the recommendation engine retrieves emotionally relevant motivational content.

The modular architecture improves scalability, maintainability, and adaptability for future enhancements.

VI. WORKFLOW ANALYSIS

The proposed framework follows a sequential emotional anal-ysis and recommendation pipeline.

The workflow begins when the user provides video input. The system processes frames, extracts facial features, identifies emotions, and retrieves contextually relevant motivational content.

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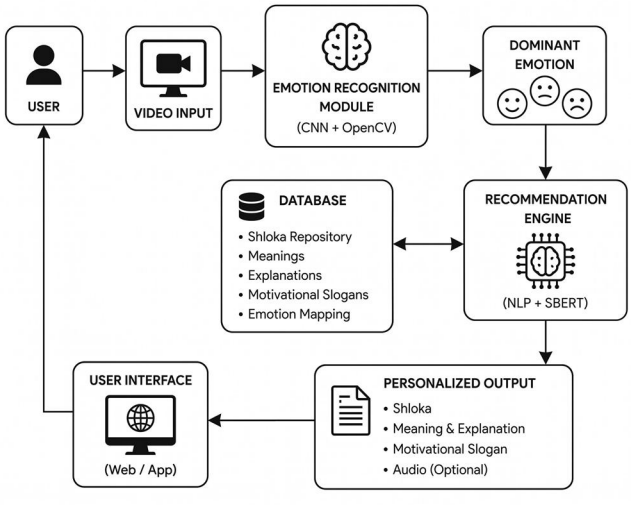


Fig. 1: Overall System Architecture

The final personalized response is displayed through the user interface.
The framework also supports optional functionalities such as:

- Emotion history tracking
- Audio playback
- Favorite shloka saving
- Personalized recommendation adaptation

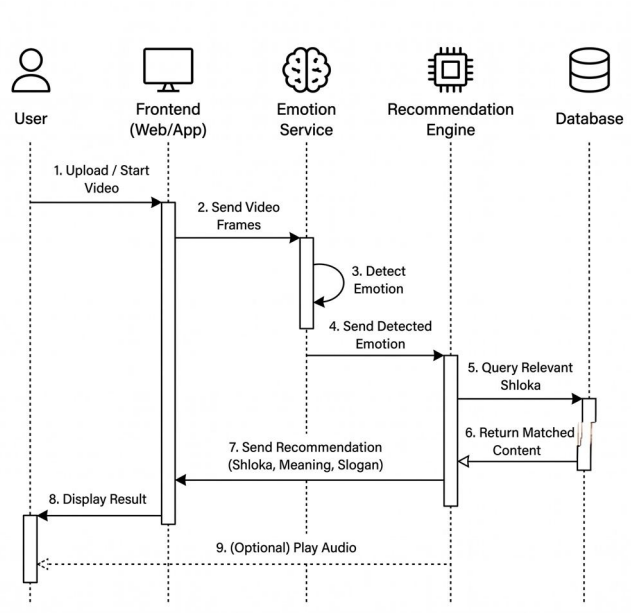


Fig. 2: System Workflow Sequence Diagram

VII. USE CASE ANALYSIS

The use case diagram illustrates the interaction between the user and the intelligent emotional guidance platform.
The user interacts with the system by providing facial input through video capture. The framework detects emotional states, identifies dominant emotions, retrieves motivational recommendations, and generates personalized guidance content.

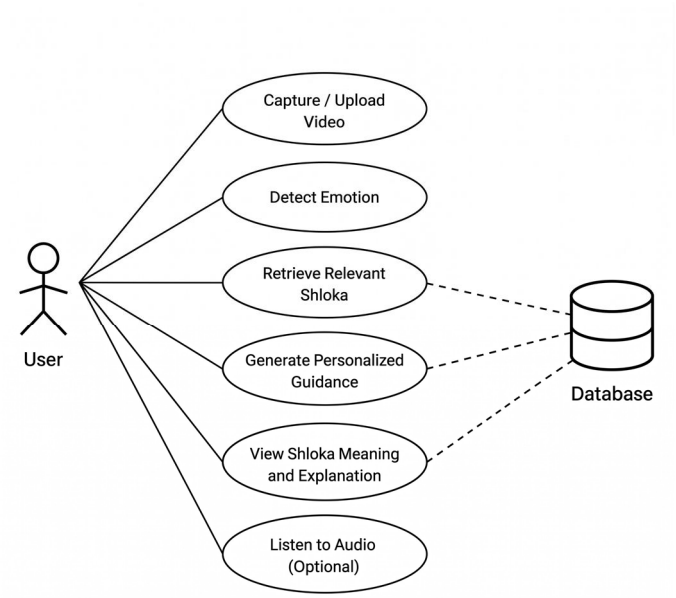


Fig. 3: Use Case Diagram

VIII. TECHNOLOGY STACK ANALYSIS

The proposed system integrates multiple technologies to achieve intelligent emotional guidance.

TABLE I: Technology Stack Used

Module	Technology	Purpose
Frontend	React.js	User Interface
Backend API	FastAPI / Flask	Request Handling
Emotion Detection	OpenCV + CNN	Facial Analysis
NLP Engine	SBERT/BERT	Semantic Matching
Database	MongoDB	Content Storage
Deep Learning	TensorFlow/Py Torch	Model Training
Audio Service	TTS Engine	Shloka Audio Output

IX. IMPLEMENTATION

The implementation combines frontend technologies, backend APIs, computer vision models, and NLP frameworks into a unified intelligent system.

The frontend interface enables users to interact with the platform seamlessly.

Backend services manage communication between the user interface, emotion analysis modules, and recommendation engine.

The emotion recognition component uses OpenCV and deep learning frameworks for facial feature extraction and emotion classification.

The CNN model was trained using TensorFlow for 50 epochs with Adam optimizer and categorical cross-entropy loss function.

NLP-based semantic matching is implemented using trans-former embeddings to retrieve contextually relevant motiva-tional content. The modular design improves flexibility and supports future integration with mobile platforms, multilingual recommenda-tion systems, and wearable healthcare devices.

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X. RESULTS AND DISCUSSION

The proposed framework demonstrates the practical feasibility of combining Facial Emotion Recognition with NLP-driven motivational recommendation systems. The FER module achieved an overall testing accuracy of 92.4% on the FER2013 dataset.

TABLE II: FER Performance Metrics

Metric	Value
Training Accuracy	94.2%
Validation Accuracy	92.1%
Testing Accuracy	92.4%

The integration of Bhagavad Gita shlokas improves emo-tional engagement and provides culturally meaningful motiva-tional guidance.

TABLE III: Comparison With Existing Systems

Feature	Existing	Proposed
Real-Time FER	No	Yes
NLP Matching	Basic	Advanced
Cultural Guidance	No	Yes

The semantic recommendation engine enhances contextual accuracy and reduces repetitive outputs.
The framework operates efficiently under real-time conditions and demonstrates smooth interaction between emotion detection, recommendation retrieval, and frontend rendering.
Although the system shows promising results, future optimization may improve classification performance under vary-ing environmental conditions such as lighting variations, partial facial visibility, and camera angle distortions.

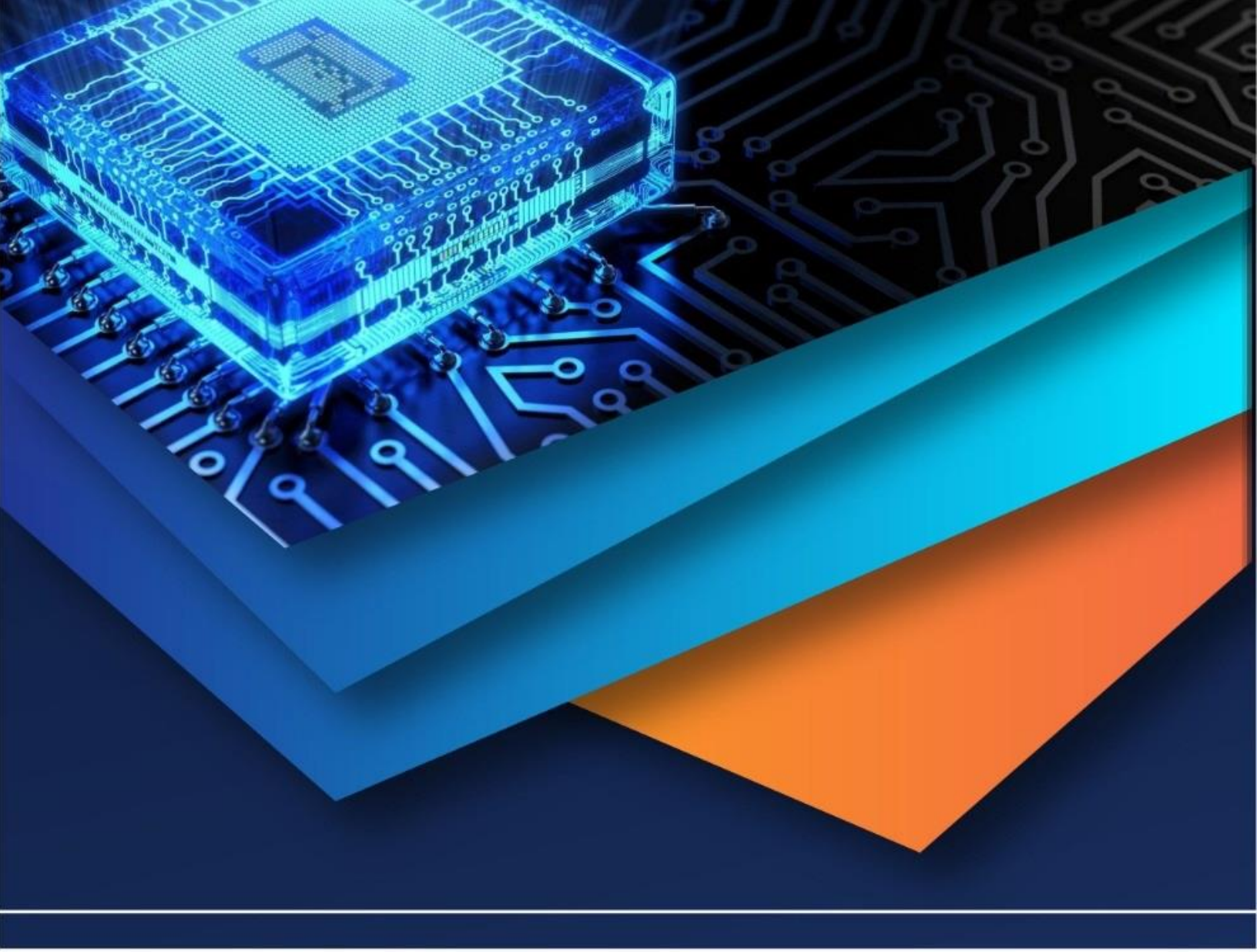
XI. CONCLUSION

This paper presented *Gita-Prerna*, an AI-based emotional guidance framework integrating Facial Emotion Recognition, deep learning, and NLP-driven recommendation systems. The proposed system analyzes facial expressions through video input and provides personalized Bhagavad Gita shlokas and motivational guidance aligned with the detected emotional state.
The framework demonstrates how emotionally intelligent AI systems can support mental wellness through adaptive, context-aware, and culturally enriched recommendations. Future enhancements may include multilingual support, voice-based emotion recognition, reinforcement learning-based personalization, mobile application deployment, and integration with wearable healthcare systems.

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