Rajalakshmi Engineering College

Department of Artificial Intelligence & Machine Learning

III Year (2025 – 2026) - AI23521: Build and Deployment of ML app

Mini Project - Abstract

Title	Hand Gesture Control using CV and Deep Learning and Deploy Using RestAPI and Docker	
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Abstract:

This project, titled “Hand Gesture–Controlled Video Manipulation System,” presents an innovative approach to human–computer interaction by enabling users to control video playback through real-time hand gestures. Instead of relying on conventional input devices such as keyboards or remotes, users can simply perform intuitive gestures to perform actions like Play, Pause, Volume Up, Volume Down, Forward, and Rewind. The system captures live video input using a webcam and processes it using Computer Vision (CV) and Machine Learning (ML) techniques to detect and classify hand gestures accurately.

The core functionality of the system is built using OpenCV for image preprocessing and frame extraction, while gesture recognition is implemented through MediaPipe or a Convolutional Neural Network (CNN) model trained on a dataset of predefined gestures. The recognized gesture is then mapped to a specific command that manipulates the playback of the video in real time. The design emphasizes low latency and smooth performance to ensure a natural and interactive experience.

To enhance portability and ease of deployment, the entire application is containerized using Docker, ensuring consistency across different environments and enabling scalable deployment on both local and cloud platforms. The project demonstrates how computer vision and machine learning can be effectively combined to create touchless interfaces that are not only engaging but also highly practical in modern contexts such as smart classrooms, media control systems, AR/VR applications, and assistive technologies for people with disabilities.

This work highlights the growing relevance of intelligent, contact-free control systems and establishes a foundation for future developments in gesture-based user interfaces.

SUPERVISOR **REVIEWER**