

FACE RECOGNITION ATTENDANCE SYSTEM

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Abstract

The Student Attendance System leverages face recognition technology to automatically record student attendance. This system uses a pre-trained VGG19 model, fine-tuned to recognize individual student faces from a dataset. The system is capable of detecting and identifying students who appear in front of a camera for a specified duration, thereby enhancing the efficiency and accuracy of attendance tracking.

Introduction

Traditional methods of tracking student attendance are time-consuming and prone to errors. With the advent of advanced computer vision techniques, automated systems can offer a more reliable and efficient solution. This project presents a student attendance system that uses real-time face recognition to record attendance. The system identifies students appearing in the camera feed for more than 10 seconds, ensuring accurate and non-intrusive attendance marking.

Methodology

1. Data Collection:
 - Images of students were collected and stored in a structured dataset.
 - Data augmentation techniques were applied to increase the robustness of the model.
2. Data Preprocessing:
 - Images were resized to 256x256 pixels.
 - Augmentation included random rotation, shear, zoom, and flipping to simulate various real-world conditions.
3. Model Training:
 - Utilized a pre-trained VGG19 model, removing the top layer and adding custom dense layers for classification.
 - Model training involved splitting the data into training and testing sets and employing an exponential decay learning rate schedule to optimize the training process.
 - Early stopping was used to prevent overfitting.
4. Face Recognition in Real-Time:
 - A Haar Cascade classifier was used for face detection in the video feed.
 - Detected faces were resized, normalized, and fed into the trained model for identification.
 - A threshold of 10 seconds was set for identifying and recording a student's presence.

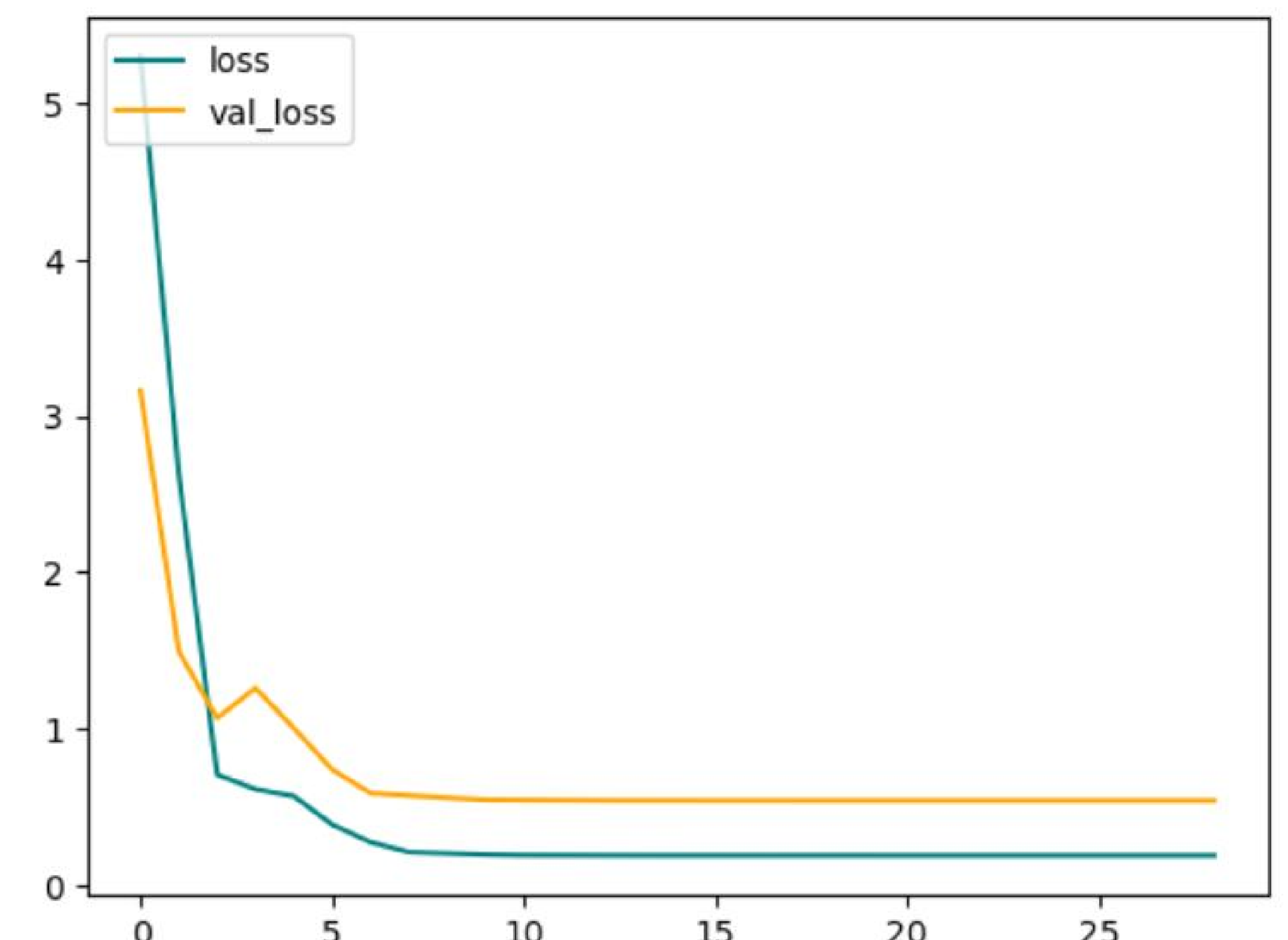
The VGG19 model is a deep convolutional neural network that is part of the Visual Geometry Group (VGG) models developed by the Visual Geometry Group at the University of Oxford. It is widely used in image classification and other computer vision tasks due to its simplicity and effectiveness.

Technologies Used

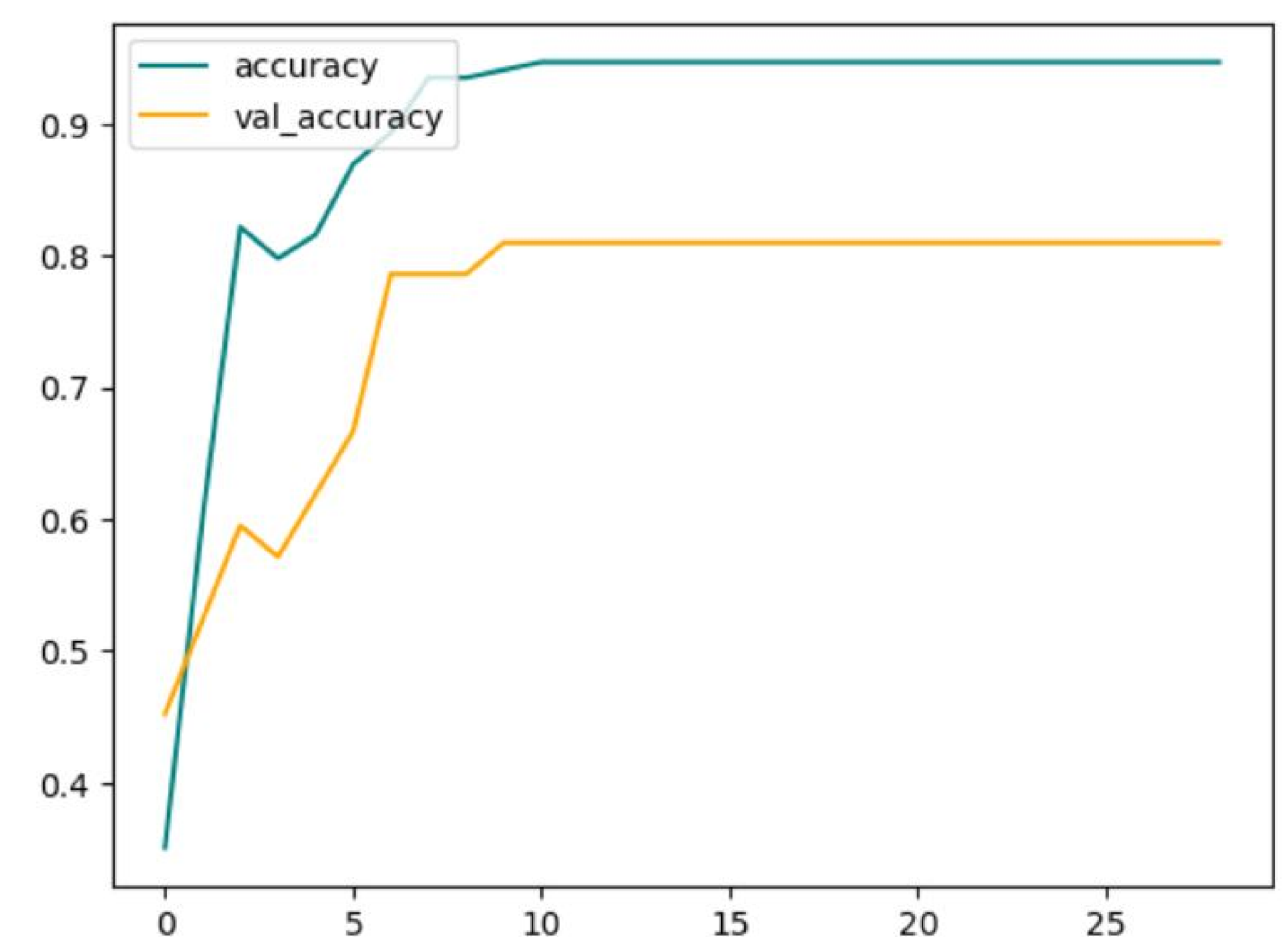


Results

Loss



Accuracy



Present Students:
Gyanendra

Conclusion

The implementation of a face recognition-based attendance system demonstrates significant improvements in accuracy and efficiency over traditional methods. The system is capable of real-time detection and recognition, making it suitable for deployment in educational institutions. Future enhancements could include integration with school databases and further optimization of the recognition algorithm to handle larger datasets and more complex scenarios.

References

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