

Real-Time Human Activity Detection Using Deep Learning

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Abstract - In recent years, the demand for intelligent surveillance systems has increased due to rising security concerns. This paper presents a real-time human activity detection system using deep learning techniques. The system classifies activities as normal or abnormal using video data. Frames are extracted from videos and processed using computer vision techniques. A Convolutional Neural Network (CNN) model is trained to recognize patterns and classify activities accurately. The system also provides real-time predictions and alerts for abnormal activities. A user-friendly web interface is developed using Streamlit to display results. The proposed system achieves good accuracy and can be used in real-world surveillance applications.

Key Words - Human Activity Detection, Deep Learning, CNN, Computer Vision, Surveillance System

1. INTRODUCTION

In modern society, security and surveillance systems play a crucial role in maintaining safety. Manual monitoring of CCTV footage is time-consuming and prone to human error. Therefore, automated systems are required to improve efficiency and accuracy.

Human activity detection is an important application of deep learning and computer vision. It involves analyzing video data to identify and classify human actions. This project focuses on detecting activities in real time and classifying them into normal and abnormal categories.

Deep learning models such as Convolutional Neural Networks (CNN) are widely used for image processing tasks. These models automatically extract important features from images, making them suitable for activity detection systems.

2. METHODOLOGY

2.1 Data Collection

Video data is collected from online sources such as Kaggle. The dataset includes videos representing both normal and abnormal activities.

2.2 Frame Extraction

Videos are processed using OpenCV to extract frames. These frames are used as input for training the model.

2.3 Data Preprocessing

The extracted frames are resized to a fixed size (64×64) and normalized. This improves model performance and ensures uniform input.

2.4 Model Training

A Convolutional Neural Network (CNN) model is used for training. The model learns patterns from input data and classifies activities accordingly.

2.5 Activity Detection

The system processes video frames in real time and predicts whether the activity is normal or abnormal.

2.6 Web Application

A web interface is developed using Streamlit. Users can upload videos and view detection results easily.

Human Activity Detection System

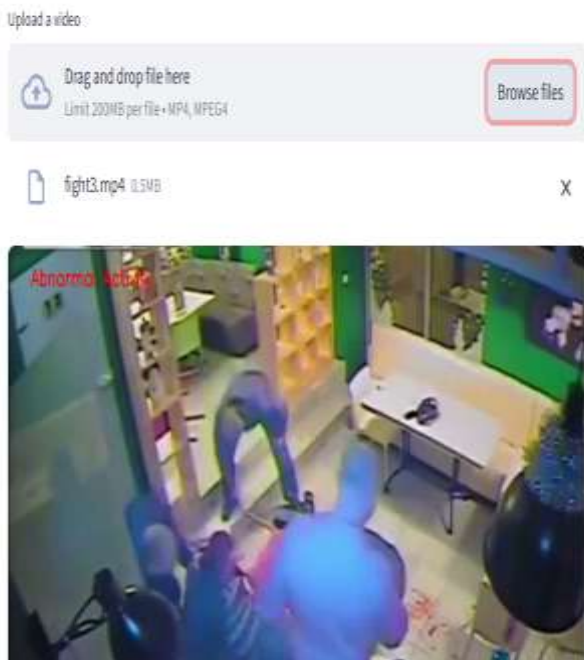


Fig -1: Activity Detection Output

Human Activity Detection System



Fig -2: Abnormal Activity Detection

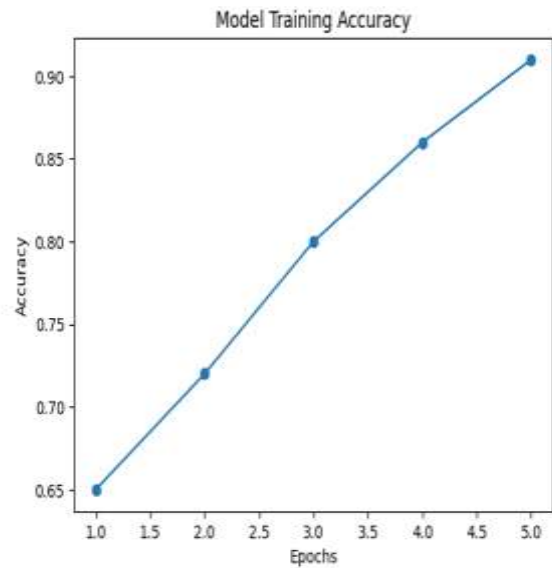


Fig -3: Model Accuracy Graph

3. CONCLUSIONS

The project successfully demonstrates a real-time human activity detection system using deep learning techniques. The CNN model provides accurate classification of activities and reduces manual effort in surveillance systems.

The integration of a web interface enhances usability and accessibility. The system can be further improved and deployed in real-world applications such as public safety monitoring and smart surveillance systems.

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5. REFERENCES

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