

# Computer Vision and Image Processing

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**Abstract:** *Computer vision and image processing have emerged as powerful technologies for developing intelligent systems capable of interpreting and understanding visual information. In this project, a real-time fall detection system is designed to enhance safety and monitoring for elderly individuals, patients, and people living alone. The system analyzes live video streams and detects sudden abnormal motion patterns using image processing techniques and deep learning-based pose estimation. The approach identifies critical changes in body orientation and movement to differentiate accidental falls from normal daily activities with high accuracy.*

*The proposed system operates continuously and sends an alert to caregivers when a fall is detected, enabling quick response and reducing the risk of injury or delayed assistance. The model is trained on video datasets containing various fall scenarios and activities of daily living to improve robustness and minimize false alarms. The solution is non-intrusive, does not require the use of wearable devices, and provides reliable monitoring without compromising user comfort.*

*Overall, this project demonstrates the effectiveness of computer vision in healthcare and smart environments. It supports elderly safety, promotes independent living, and highlights the potential of visual intelligence in future assistive technologies.*

**Keywords:** Computer Vision, Image Processing, Object Detection, Feature Extraction, Deep Learning, Pattern Recognition, Image Segmentation, Classification, Convolutional Neural Networks (CNN).

