

ABSTRACT

The issue of individual safety and security, especially for the elderly and individuals at high risk of falling, is an important issue in healthcare. Falls can result in serious injuries, such as pain, fractures, disability, and even death. Therefore, early detection of falls is essential to reduce further risks. Computer vision-based pose recognition technology is one of the promising approaches to detect falls in real-time and precisely, without the need for body-mounted devices. However, the biggest challenge in fall detection systems is how to ensure high accuracy while keeping computational complexity stay low to support implementation on devices with limited resources.

The purpose of this research is to develop a fall detection system using Support Vector Machine (SVM) algorithm with the help of Mediapipe feature. Mediapipe is a machine learning-based framework that can detect and track body poses efficiently. The features that will be extracted by Mediapipe will be used as an input for classification model using SVM. SVM was chosen as the classification algorithm because it has the advantage of handling high-dimensional datasets and can provide accurate classification results for limited datasets.

The results show that the combination of MediaPipe with SVM can achieve high accuracy results in detecting fall poses compared to traditional methods. The system shows promising performance for the implementation of real-time health monitoring applications as it has advantages in processing speed and can provide a high level of accuracy. Therefore, this research can help provide technology-based solutions to reduce the risk of fall injuries and improve people's quality of life.

Keywords: *Pose Estimation, Support Vector Machine (SVM), machine learning, Mediapipe, Fall*