

A Machine Learning Pipeline for Real-Time Activity Detection on Low Computational Power Devices for Metaverse Applications

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Abstract : This paper presents our recent work on real-time human activity detection based on the media pipe pipeline and machine learning algorithms. The proposed system can detect human activities, including running, jumping, squatting, bending to the left or right, and standing still. This is a robust solution for developing a yoga, dance, metaverse, and fitness application that checks for the correction of the pose without having any additional monitor like a personal trainer. MediaPipe solution offers an open-source cross-platform which utilizes a two-step detector-tracker ML pipeline for live detection of key landmarks on our body which can be used for motion data collection. The prediction of real-time poses uses a variety of machine learning techniques and different types of analysis. Without primarily relying on powerful desktop environments for inference, our method achieves real-time performance on the majority of contemporary mobile phones, desktops/laptops, Python, or even the web. Experimental results show that our method outperforms the existing method in terms of accuracy and real-time capability, achieving an accuracy of 99.92% on testing datasets.

Keywords : human activity detection, media pipe, machine learning, metaverse applications

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