Realtime human pose recognition based gameplay

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Abstract:

Realtime multi-person 2D pose estimation is a key component in enabling machines to have an understanding of people in images and videos. A realtime approach- OpenPose is a novel approach used to detect the 2D pose of multiple people in an image. This method uses a nonparametric representation, which is referred to as Part Affinity Fields (PAFs), to learn to associate body parts with individuals in the image. The bottom-up system achieves high accuracy and real time performance, regardless of the number of people in the image. In previous work, PAFs and body part location estimation were refined simultaneously across training stages. A PAF-only refinement is demonstrated rather than both PAF and body part location refinement, which results in a substantial increase in both runtime performance and accuracy. A combined body and foot keypoint detector, based on an internal annotated foot dataset that shows that the combined detector not only reduces the inference time when compared to running them sequentially, but also maintains the accuracy of each component individually. This work has been culminated in the release of OpenPose, the first open-source real time system for multi-person 2D pose detection, including body, foot, hand, and facial keypoints. In this application a real-time pose detection based game play is developed, allowing the player to have direct control over the in-game character through body movement and posture. This application enables the user to have an immersive and interactive gaming experience in virtual environments.

References:

[1] Zhe Cao et.al, “OpenPose: Realtime Multi-Person 2D Pose Estimation using Part Affinity Fields”, IEEE Transactions on Pattern Analysis and Machine Intelligence 2019

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