Analysis of performance between kinect v1 and kinect v2 for various facial part movements

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ABSTRACT
The aim of this study is to determine the suitable version of Kinect motion sensor for developing facial therapy or exercise throughout the analysis of face tracking performance. A face tracking system is developed in both version of Kinect cameras by referring to the respective version of Kinect SDK. The created face tracking algorithms are then modified to display the detected facial points which are 121 points and 1347 points in total for Kinect v1 and Kinect v2 respectively. A total number of 18 desired facial feature point at similar landmarks will be extracted in the format of 3D coordinates for both Kinect cameras. To investigate the changes in the movement of facial feature points, the points will be paired up for distance ratio calculation between different frames of face image. The action unit of facial points for both Kinect cameras are different and there are some improvements in Kinect v2: asymmetrical facial points, high definition face detection and eye tracking as added action units. However, it shows poor detection in outer eyebrow part compared to Kinect v1. In overall, the Kinect v2 has better performance than Kinect v1 as it provides faster response speed and more detailed facial points movement detection in real-time operation for rehabilitation purposes.

KEYWORDS
Kinect v1; Kinect v2; Face tracking; Asymmetry; Animation unit; Facial part movement

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