DIGITAL ANALYSIS OF BADMINTON ATHLETE MOTION

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Abstract

Badminton is a sport that combines several different physical aspect. At a professional level, the sport demands excellent fitness criteria namely the player's aerobic stamina, agility, strength, speed as well as precision. This study essentially entails the development of an innovative training system that incorporates technology that could improve the athlete's performance. This system uses a combination of two Kinect, and relevant sensors that are required to capture necessary parameters for badminton analysis such as the motion detection, as well as the acceleration of the player. The training system can be used by the coach and/or biomechanics to analyse the performance of the athletes. The motion detection of the athlete is captured by means of Kinect skeleton tracking algorithm that tracks up to 20 joints of the body including their x-axis, y-axis and z-axis coordinates. An external device (a miniaturised Bluetooth, 6 DoF accelerometer and microprocessor) attached at the rear of the racquet's handle is used to measure the motion of the racquet. The data is transferred via Bluetooth to an Android-based tablet device. The skeleton coordinates obtained from the tracking algorithm are in good agreement with the measurement taken from Kinect. In addition, the acceleration results achieved from the device attached to the racquet shows promising results, which enables pattern recognition of different strokes in badminton. The miniaturised device, as well as Kinect, have demonstrated its efficacy in measuring the necessary parameters in analysing the performance of badminton players.

Keywords: Motion capture, sports engineering, kinematics, badminton