

Study of a Novel Knee Training System with Computer Vision Technology
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Abstract

A novel intelligent knee training system has been developed which uses charge coupled device (CCD) and sports device with appropriate software to identify physical movements based on the color of trousers and figure out the push-kick angle according to every push-kick movement of the user. The displacement of push-kick angle controls the tray during games so as to achieve the effect of interactive games. This system has two modes , training mode and game mode, for interactive exercise training and for training the force output of knee joints .The user' s heart rate, consumed calories, game scores and sport time were recorded during both modes, Since the muscular endurance training in the training mode requires the user to keep the same posture, the computing mode for consumed calories in the training mode and game mode was different. A comparison curve was made based on several training records and history data to analyze the exercise condition of the user. Our study demonstrated that the interface for interactive game can increase the entertainment quality of the exercise. It is expected that system technology could be applied to the related field, such as exercises, body fitness, and digital entertainment

Keyword : Knee training, system, Training mode, Game mode, Interactive game