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Developing an Intelligent Table Tennis Ball Machine with Human Play Simulation for Technical Training

Authors : Chen-Chi An, Jun-Yi He, Cheng-Han Hsieh, Chen-Ching Ting

Abstract : This research has successfully developed an intelligent table tennis ball machine with human play simulate all situations of human play to take the service. It is well known; an excellent ball machine can help the table tennis coach to provide more efficient teaching, also give players the good technical training and entertainment. An excellent ball machine should be able to service all balls based on human play simulation due to the conventional competitions are today all taken place for people. In this work, two counter-rotating wheels are used to service the balls, where changing the absolute rotating speeds of the two wheels and the differences of rotating speeds between the two wheels can adjust the struck forces and the rotating speeds of the ball. The relationships between the absolute rotating speed of the two wheels and the struck forces of the ball as well as the differences rotating speeds between the two wheels and the rotating speeds of the ball are experimentally determined for technical development. The outlet speed, the ejected distance, and the rotating speed of the ball were measured by changing the absolute rotating speeds of the two wheels in terms of a series of differences in rotating speed between the two wheels for calibration of the ball machine; where the outlet speed and the ejected distance of the ball were further converted to the struck forces of the ball. In process, the balls serviced by the intelligent ball machine were based on the received calibration curves with help of the computer. Experiments technically used photosensitive devices to detect the outlet and rotating speed of the ball. Finally, this research developed some teaching programs for technical training using three ball machines and received more efficient training.

Keywords : table tennis, ball machine, human play simulation, counter-rotating wheels
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