Development of the table tennis robot launcher

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ABSTRACT
Table tennis is a dual sport in which two teams compete against an opposing side. In training conditions, it needs consistently receive the ball with varying ball spins and angles to improve the athlete's skills. Therefore, this study aims to develop an automatic table tennis robot that can launch the ball in a different way of rotation. Two 12 V DC motors were placed against each other to produce the opposite direction of ball spin. While four types of rotations which are topspin, backspin, right spin, and left spin, were considered in the evaluation. The microcontroller was used to control the system, including the motor speed and launcher's angle itself. Hence, the combination of variables applied can be customised and increasing the difficulties of training level. In addition, the setting of robot movement can be set up via the control board or wirelessly using Android apps. The reliability study was concerned with the consistency of ball bouncing, ball rotation as well as ball launching. The performance of this robot launcher is satisfactory when the error is less than 5% from the entire repetitive testing. In the experimental session, it is shown that the capability of ball shooting distance, the feed rate of a ball launched, and the ability of the robot launcher to do various ball spins are achieved and suitable to the player. Thus, this table tennis robot launcher benefits the athlete's self-training to improve their skills and technique.

KEYWORDS
Android app; Launcher; Robot; Table tennis

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