

## ABSTRACT

### A Projectile Generating Device: The Characteristics of a Cricket Bowling Machine

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The act of projecting an object into free flight, using a machine, was an obsession from man's early inventions. The first devices were of necessity due to war whereas our inventions today are mostly to relieve man from repetitive tasks. It turns out that they are only a few efficient methods however; it is the applications found for these devices that have been most beneficial to humans.

After almost twenty years of world dominance of the game of Cricket, from the mid-1970s to the mid-1990s, the West Indies cricket team now find themselves close to the bottom of the world standings. The team's hierarchy has requested assistance on many fronts to reverse the situation and these include technical assistance and innovation to assist in the development of the game, at all levels.

The use of cricket bowling machines has become more widespread in the Caribbean in recent years, even at club level. However, machines available are expensive and few can recreate the characteristics of a human bowler, with great

accuracy. This thesis will investigate and quantify the characteristics of a prototype machine, with the objectives of producing an efficient, accurate, and economical design. The prototype will be hereafter called The Cricket Bowling Machine (CBM).

The design is based on two counter-rotating wheels, mounted side by side, each on the shaft of a DC motor. The speed of each motor is under computer control and determines the characteristics of a projected ball, in addition to the angle of the ball's exit. Variations in these parameters will subsequently allow the reproduction of most human bowling deliveries.

The Cricket Bowling Machine will utilise a basic Liquid Crystal Display (LCD) user interface for operator options and feedback. A single micro-controller will act as the controller for the user interface and the motor control. The CBM will be constructed with off-the-shelf components, unless unavoidable, in an attempt to reduce cost yet maintain adequate quality.

**Keywords:** The Cricket Bowling Machine (CBM); prototype; Liquid Crystal Display (LCD); micro-controller.