MATHEMATICAL PREDICTION MODELLING OF OPTIMUM PENALTY SHOT IN HOCKEY FIELD

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MAC 2013

3. Acknowledgements

IN THE NAME OF ALLAH, THE MOST GRACIOUS. THE MOST MERCIFUL

First and foremost, I am grateful to Allah S.W.T for giving us the strength and blessing us with good health to complete this project successfully

We would like to express our special gratitude to UiTM for support us by giving Dana Kecemerlangan and UiTM(T), especially PJI unit for the valuable guidance, cooperation and encouragement. Without these, this project would have been impossible.

We are also very thankful to our beloved parents who has given us encouragement and to all our friends who have given us ideas and continuous support throughtout the preparation of this report.

Last but not least, to all who contributed directly or indirectly in this project. Without them, this project cannot be completed in time. We will always remember their help and advise.

5. Report

5.1 Proposed Executive Summary

Background of Research - Goal in the hockey game can be scored from general play or from penalty corners or penalty strokes. A penalty corner can be awarded if a defending player commits a foul inside the shooting circle or any other part of the pitch between the goal line and the 25 yard line. A penalty stroke may be awarded for any several serious fouls, including illegally stopping an attacker from scoring a goal. A penalty stroke is taken from 7 yards out from goal and only the goalkeeper of the defending team can try to stop it. Missed penalty strokes are often demoralizing to players because it is an easy opportunity to score.

Objective - Our objective in this paper is to determine the best angle and velocities for a penalty stroke to shoot a ball to ensure a very high success rate.

Research Methodology/Design/Approach – Simple projectile motions theory is used in this paper to determine the best velocity, while the best angle is calculated using right angles triangles and trigonometric ratios.

Expectation Outcome – Proposed a better way to score a penalty stroke using the optimized angle and velocities that have been calculated.

5.2 Enhanced Executive Summary

Goal in a hockey game can be scored from penalty strokes. In the penalty stroke, only the goalkeeper can stop the ball from entering the goal area. The chance to score a goal depends totally on the ability of the penalty taker to strike the ball efficiently. Due to the pressure experienced by the penalty taker to ensure a goal is scored, it is crucial for him to know the best angle and velocity to shoot the ball. Simple projectile motions theory is used in this paper to determine the best velocity, while the best angle is calculated using right angled triangles and trigonometric ratios.

Keywords: Angle, velocity, projectile motion, penalty stroke

Contents