

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

THE OPTIMUM RELEASE ANGLE IN THE  
SHOT PUT BY USING KINEMATICS  
EQUATION

P28519

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## ABSTRACT

Shot put has been divided into four phases which are preparation phase, glide phase, delivery phase and recovery phase. Athletes seem hard to find weaknesses that need to be improved to get highest range for their performance. However, there is a possibility that release angle, release velocity and release height have affected the range of the shot. This study has focused on release angle and also the release velocity of the athletes to get the maximum range. The Vitruvian Man Model is used to find the release height of the shot for all angle from  $36.0^\circ$  to  $46.0^\circ$ . The derived kinematic equation in Projectile Motion Model is applied to calculate the release velocity of the shot for all angle from  $36.0^\circ$  to  $46.0^\circ$ . Then, by evaluating the average release velocity, use the value using the other derived kinematic equation to solve for the displacement (range of the shot). The optimum angle is determined by analysing the value of the displacement. The highest value indicates that its angle is an optimum angle for the shot. Hence, the result shows the optimum angle is about  $42^\circ$  to  $43^\circ$ . From this research, the athletes can improve and maximize the range of the shot by using the optimum angle. The rotational and gliding method only causes a slight influence on the range of the shot, therefore the limit of our study is on gliding method only. Furthering this study in the future for the other throwing method might give the same value of the optimum angle.