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Optimization Parameters Using Response Surface Method on Biomechanical Analysis for Malaysian Soccer Players

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Abstract : Soccer is very popular and ranked as the top sports in the world as well as in Malaysia. Although soccer sport in Malaysia is currently professionalized, but it's plunging achievements within recent years continue and are not to be proud of. After review, the Malaysian soccer players are still weak in terms of kicking techniques. The instep kick is a technique, which is often used in soccer for the purpose of short passes and making a scoring. This study presents the 3D biomechanics analysis on a soccer player during performing instep kick. This study was conducted to determine the optimization value for approach angle, distance of supporting leg from the ball and ball internal pressure respect to the knee angular velocity of the ball on the kicking leg. Six subjects from different categories using dominant right leg and free from any injury were selected to take part in this study. Subjects were asked to perform one step instep kick according to the setting for the variables with different parameter. Data analysis was performed using 3 Dimensional "Qualisys Track Manager" system and will focused on the bottom of the body from the waist to the ankle. For this purpose, the marker will be attached to the bottom of the body before the kicking is perform by the subjects. Statistical analysis was conducted by using Minitab software using Response Surface Method through Box-Behnken design. The results of this study found the optimization values for all three parameters, namely the approach angle, 53.6º, distance of supporting leg from the ball, 8.84sm and ball internal pressure, 0.9bar with knee angular velocity, 779.27 degrees/sec have been produced.

Keywords : biomechanics, instep kick, soccer, optimization
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