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Biomechanics

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Preliminary Analysis

This is Cristiano Ronaldo’s goal against his former club F.C. Porto during the 2008-2009 Champion’s League quarterfinal stage. His shot comes in the sixth minute of the game where they (Manchester United) were already losing 0-1 on aggregate and needed to score and win the game in an outright manner. Ronaldo’s goal is remarkable for quite a few reasons: 1) He took his shot off a turn (ball still in motion); 2) the distance from which he hit the ball; and, 3) the efficiency of his strike. Some of the biomechanical applications that can be observed or that are brought into question from the initial viewing of the skill are as followed**; angular motion, position, distance travelled vs displacement, speed, acceleration, linear momentum, newton’s second law of motion, impulse, work, power, center of gravity, tangential acceleration**. In the video, Ronaldo receives the ball from his teammate (Anderson) and he opens his hips while making a touch and turning, then he takes an extra touch where he uses that time that the ball is moving away from him to increase his own velocity and refine his approach angle so as to get the maximum force generated to connect with the ball to complete his shot.

Ronaldo’s approach/position in relationship to the ball is at about a 45-degree angle which is the angle at which the most force can be generated during a kick because of the shift in his body, we know that his center of gravity is also moved. Ronaldo’s angular motion comes into the picture as soon as the initial ball is passed to him where he turns and faces the field. The distance travelled and displacement in this skill would be the same as the ball moved in a straight line from the point of contact to the point where it hits the back of the net. The ball undergoes a massive change in speed and velocity the moment that it is encountered by the swinging leg of Ronaldo (speed=distance travelled/change in time; velocity=displacement/change in time). The formula for acceleration would be necessary in the analysis because the ball accelerated rapidly and then got up to a speed of 64.2 Mph (as reported by Football Direct). L=mv would be used to determine the linear momentum of the ball as it is kicked.

For me, the biggest point of this analysis would be centered on Newton’s second law of motion which states that an object that speeds up, slows down, or changes direction is accelerating because a net external force is being applied to it to cause a change in its acceleration. As a result of this momentum change not only of the ball but of Ronaldo’s leg in the limb swing to foot contact stages.

Best Cristiano Ronaldo Goal Manchester United vs Porto --<https://www.youtube.com/watch?v=EpBmBbZtVJY>