

STEAMS Methodology of Sports Science and Biology

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Abstract

This paper studies sports injury risks and prevention, specifically focusing on figure skating. USFSA STARS science and injury biomechanics are also illustrated. Modern 3D-motion techniques were introduced to help develop sports strength training curriculum -- sports injury failure modes and injury prevention stretching techniques were analyzed and used to develop a cohesive curriculum. Clustering Principal Component Analysis was utilized to understand the different clustering methods that can help select the appropriate clustering algorithms to discover more injury insights. Statistical data visualization tools were used to provide more correlation and causation patterns on understanding the injury mechanisms. Using results from our statistical analysis, the appropriate injury prevention program was developed for figure skaters.

Keywords

Sports, injury, figure skating, clustering, PCA