عنوان مقاله:

Shot-ViT : Cricket Batting Shots Classification with Vision Transformer Network

نویسندگان:

A. Dey - Department of Computer Science and Technology, Indian Institute of Engineering Science and Technology, Shibpur, Howrah, India

S. Biswas - Department of Computer Science and Technology, Indian Institute of Engineering Science and Technology, Shibpur, Howrah, India

خلاصه مقاله:

In the realm of computer vision applied to cricket analysis, classifying batting shots poses a formidable challenge, demanding nuanced comprehension and categorization. The classification of cricket shots is crucial as it empowers the players to strategically assess, adapt, and execute their game plans effectively, shaping the outcome of matches. This article introduces the Cricket Batting Shots Image dataset (CBSId), a new benchmark dataset comprising ۲۱۶۰ meticulously annotated cricket shot images across seven distinct categories. The core objective of this research is to develop a robust system capable of effectively classifying cricket batting shots from images. To address this, we present a fine-tuned Vision Transformer-based model specifically adapted for cricket shot classification, termed Cricket Batting Shot Vision Transformer (Shot-ViT). Our proposed methodology demonstrates exceptional performance, achieving ۹۲.۵۸% validation accuracy on the CBSId. Shot-ViT notably outperforms established models such as VGG۱۹, ResNet۵۰, I-AlexNet, and ViT_B۳۲ in cricket shot classification accuracy, showcasing the remarkable capabilities of Vision transformers in surpassing existing deep learning architectures for complex visual tasks. Vision transformers have the capacity to capture global context and long-range dependencies within images through self-attention mechanisms, enabling effective feature extraction and representation, which traditional models may struggle to achieve. The accurate classification of cricket batting shots holds profound implications for cricket coaching, player development, and match analysis. It has the potential to revolutionize training methodologies, providing players and coaches with precise insights into batting techniques and strategies and thereby contributing to the overall advancement of the sport.

کلمات کلیدی:

Cricket Batting Shots, Shots Classification, Vision Transformer Network, computer vision, action recognition

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/2044729