Split Estimation

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Overview

In gymnastics, these split positions are crucial skills that are judged based on whether the gymnast achieves a 180° angle in the split. However, judging is subjective especially since these movements happen quickly. In this project, we leverage pose estimation techniques to analyze the split positions performed by gymnasts during leaps and jumps. To determine the angle of the split, we isolate the gymnast in the image using MediaPipe [4] bounding box detection, determine the body pose of the gymnast, and then calculate the angle between the vectors created by the key points. We explore different pose estimation datasets (the Halpe-FullBody [2] and Extended Leeds Sports Pose [3] datasets) trained on popular architectures like AlphaPose [2] and UniPose [1]. The final results show that the AlphaPose model trained on the LSP dataset can effectively estimate the split angle.

Results



References

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- [3] Sam Johnson and Mark Everingham. Learning effective human pose estimation from inaccurate annotation. In Proceedings of Computer Vision and Pattern Recognition (CVPR) 2011, 2011.
- [4] Camillo Lugaresi, Jiuqiang Tang, Hadon Nash, Chris McClanahan, Esha Uboweja, Michael Hays, Fan Zhang, Chuo-Ling Chang, Ming Yong, Juhyun Lee, Wan-Teh Chang, Wei Hua, Manfred Georg, and Matthias Grundmann. Mediapipe: A framework for perceiving and processing reality. In *Third Workshop on Computer Vision for AR/VR at IEEE Computer* Vision and Pattern Recognition (CVPR) 2019, 2019.