Learning To Score Olympic Events

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I found an interesting paper named *Learning To Score Olympic Events*. It mainly introduce a valid method to estimate sports action quality, which is complex to achieve because the process of assigning a "score" to the execution of an action contributes to difficulty as shown in Fig 1. Unlike action recognition, which has millions of examples to learn from, the action quality datasets that are currently available are small typically comprised of only a few hundred samples.

Figure 1: Images from gymnastic vault, diving and figure skating datasets. For gymnastic vault, we illustrate the viewpoint variations; first row shows the take-off, second row shows the flight while the third row shows the landing; images from different samples are shown in different columns.

This work presents three frameworks for evaluating Olympic sports which utilize spatiotemporal features learned using 3D convolutional neural networks (C3D) and perform score regression with

1. SVR.

2. LSTM.

3. LSTM followed by SVR.

Datasets	Driving		Skating	Vault
Samples	1000/59	300/70	1000/70	120/56
C-S	0.74	0.78	0.53	0.66
C-L(F)	0.05	0.01	-	-0.01
C-L(I)	0.36	0.27	-	0.05
C-L-S(F)	0.56	0.66	-	0.33
C-L-S(I)	0.57	0.66	-	0.37

Table 1: Olympicscore prediction comparison with literature.(C = C3D, S = SVR, L = LSTM, F = Final, I = Incremental).

An efficient training mechanism for the limited data scenarios is presented for clip-based training with LSTM.While the SVR-based frameworks yield better results, LSTM-based frameworks are more natural for describing an action and can be used for improvement feedback.

We evaluate the action quality assessment frameworks on three Olympic sports which are scored by judges,

1. figure skating

2. diving and

3. gymnastic vault.

A full sum-mary of all results can be found in Table 1.

References

[1] Paritosh Parmar and Brendan Tran Morris. Learning to score olympic events. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, July 2017.