

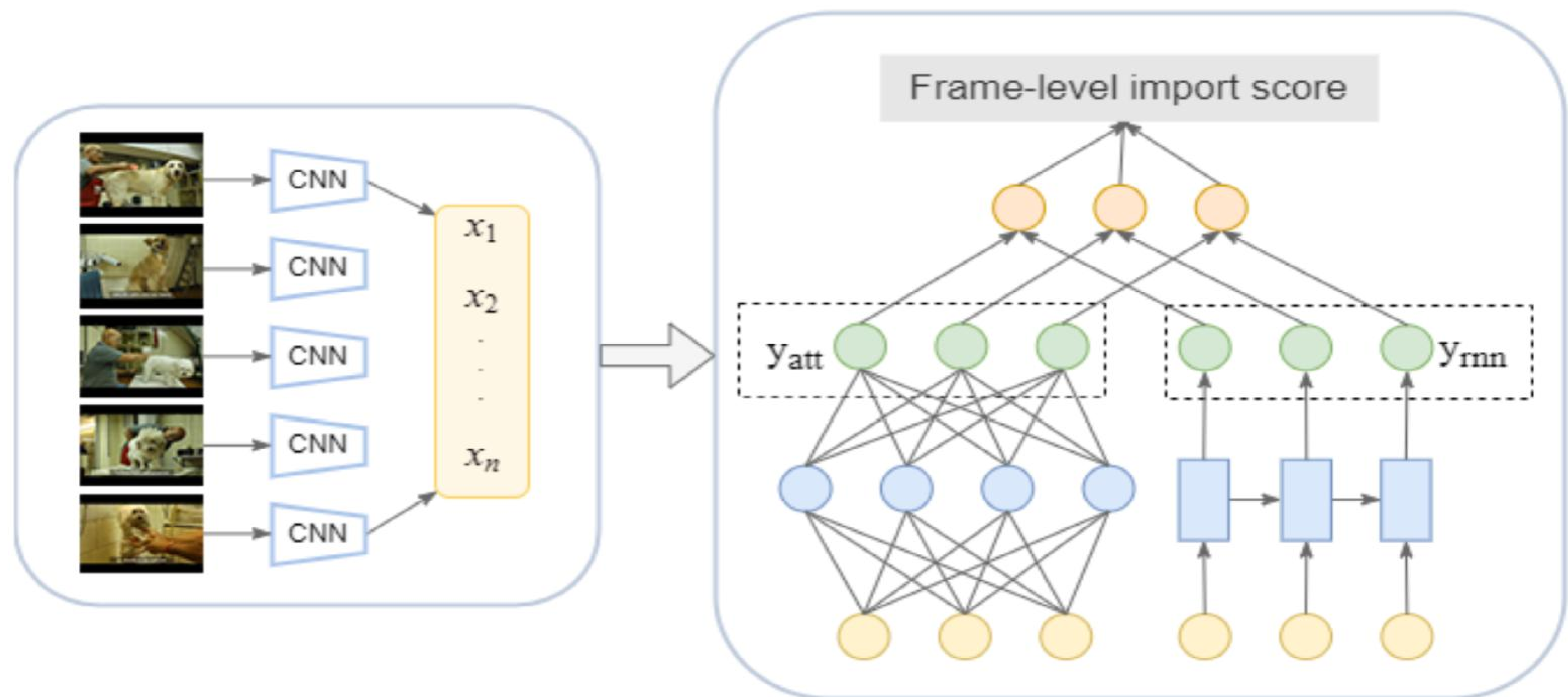


Wide and Deep Learning for Video Summarization via Attention Mechanism and Independently Recurrent Neural Network

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Network Overview



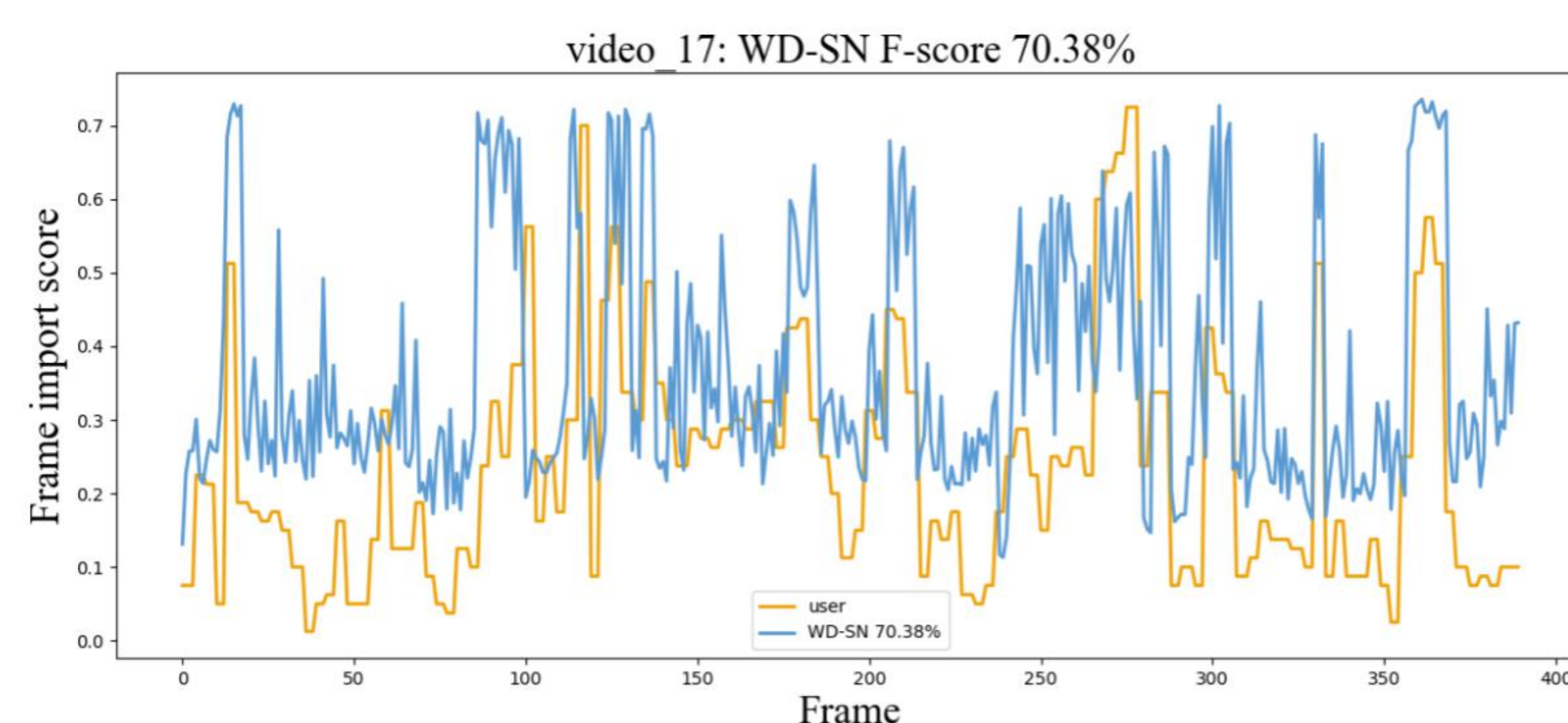
Contribution

- developed a wide and deep encoder-decoder framework for video summarization, named WD-SN. It is a supervised video summarization framework that learns how humans select video shots.
- The wide component is implemented by the attention mechanism, and the deep component is implemented by IndRNN, taking into account the global and temporal features. As far as we know, IndRNN is used for the first time in video summarization.

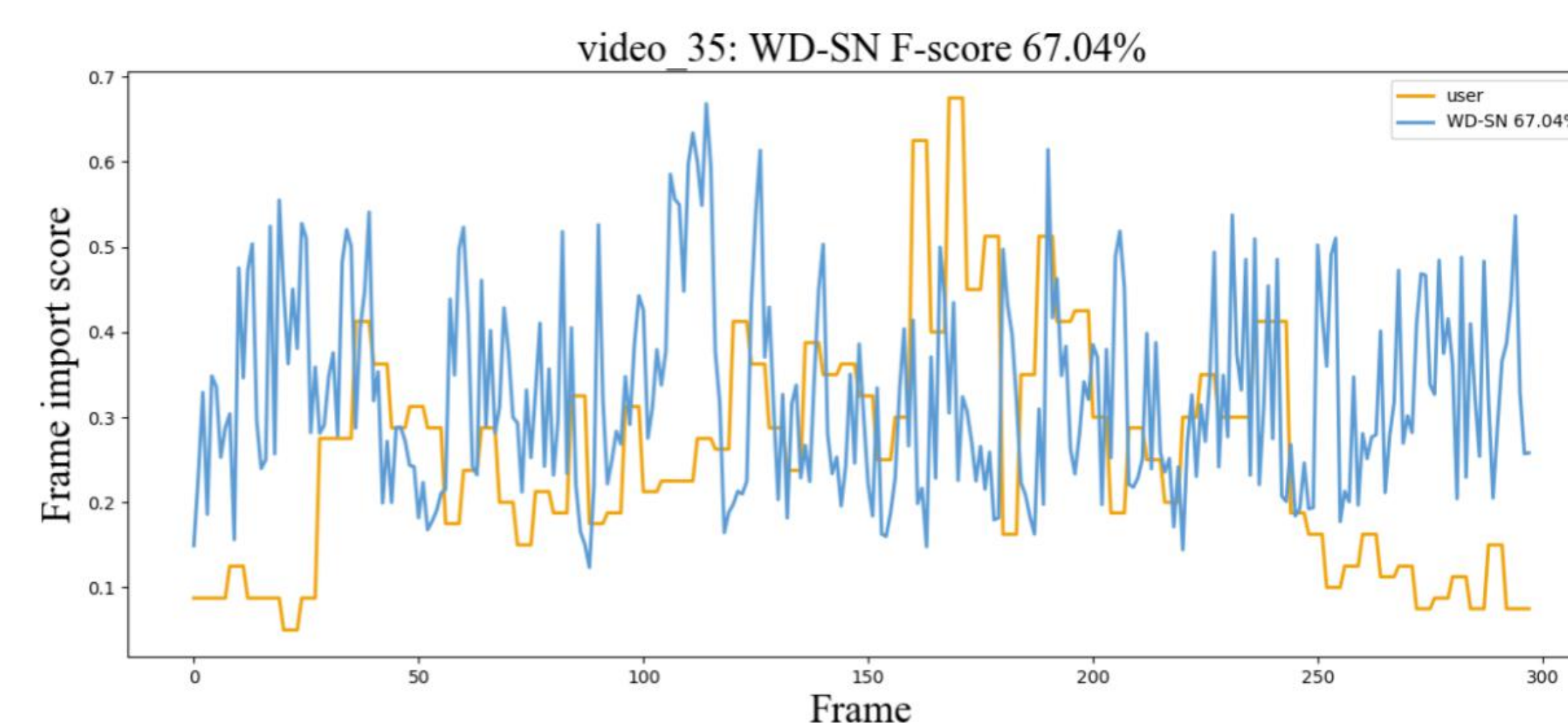
Experimental Result

Methods	TVSum		SumMe	
	Canonical	Augmented	Canonical	Augmented
dppLSTM (ECCV 2016)	54.7	59.6	38.6	42.9
DR-DSNsup (AAAI 2018)	58.1	59.8	42.1	43.9
SUM-GANsup (CVPR 2017)	56.3	61.2	41.7	43.6
A-AVS (TCSVT 2019)	59.4	60.8	43.9	44.6
M-AVS (TCSVT 2019)	61.0	61.8	44.4	46.1
VASNet (ACCV 2018)	61.42	62.37	49.71	51.09
WD-SN (proposed method)	61.96	62.66	49.95	52.61

Qualitative Result

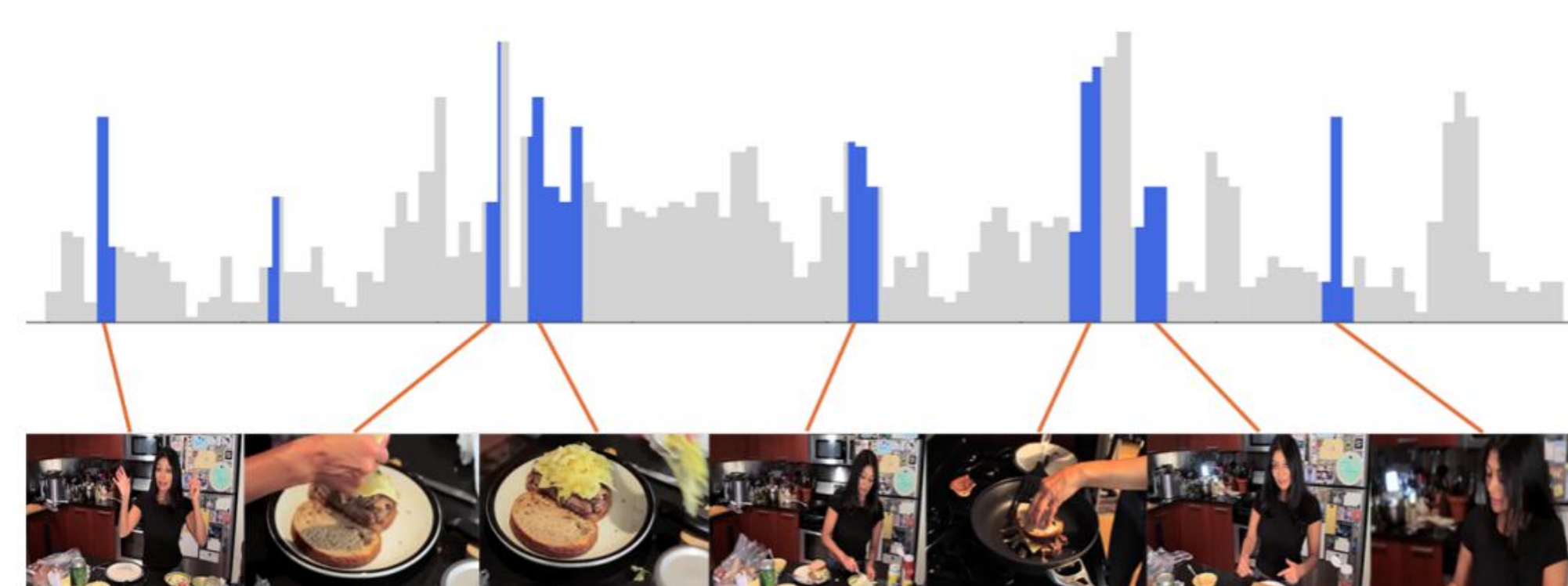


(a) video 17 in TVSum

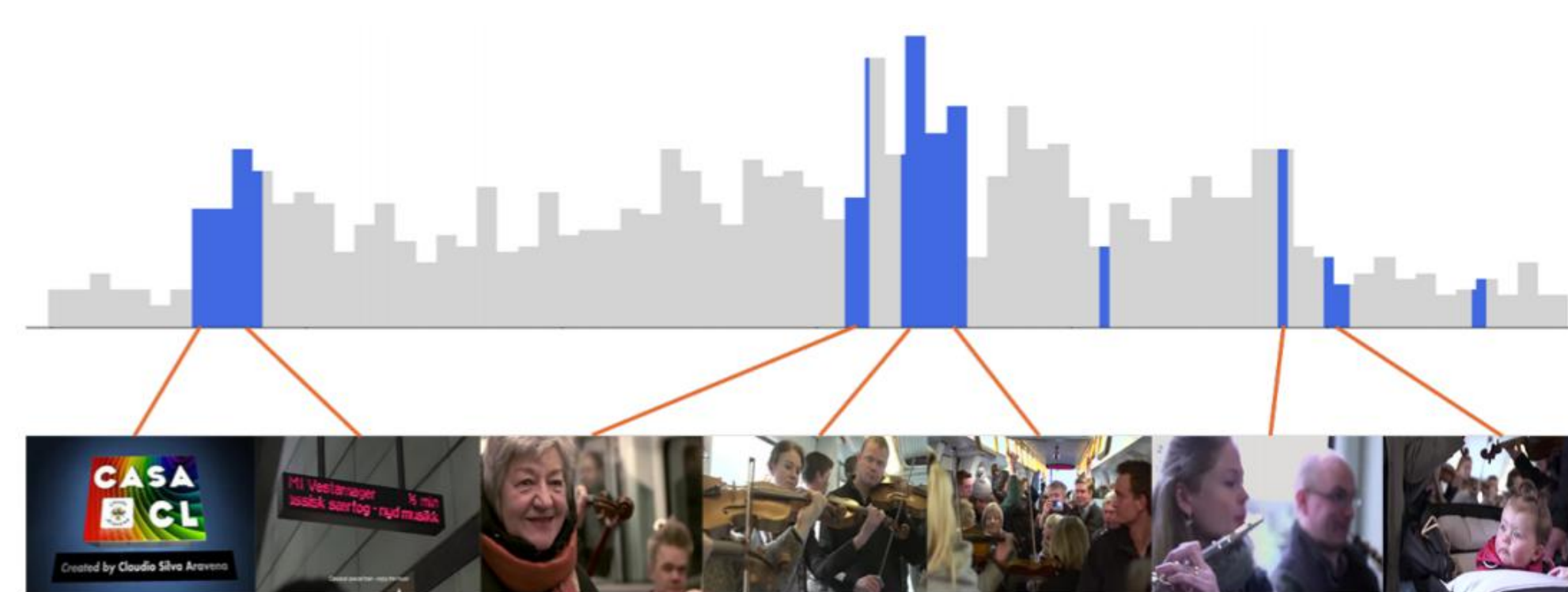


(b) video 35 in TVSum

The ground-truth (yellow) and machine-generated (blue) importance scores for test videos 17 and 35 from TvSum dataset are visually presented.



(a) video 17 in TVSum



(b) video 35 in TVSum

The generated summaries (blue) from the sample video cover the ground truth (gray), and the corresponding video frames are displayed below.

References

- [1] Kaiyang Zhou, Yu Qiao, and Tao Xiang, "Deep reinforcement learning for unsupervised video summarization with diversity-representativeness reward," in Thirty-Second AAAI Conference on Artificial Intelligence, 2018.
- [2] Ke Zhang, Wei-Lun Chao, Fei Sha, and Kristen Grauman, "Video summarization with long short-term memory," in European conference on computer vision. Springer, 2016, pp. 766–782.
- [3] Shuai Li, Wanqing Li, Chris Cook, Ce Zhu, and Yanbo Gao, "Independently recurrent neural network (indrnn): Building a longer and deeper rnn," 2018.