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Deep Learning Based Unsupervised Sport Scene Recognition and Highlights Generation

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Abstract : With increasing amount of multimedia data, it is very important to automate and speed up the process of obtaining meta. This process means not just recognition of some object or its movement, but recognition of the entire scene versus separate frames and having timeline segmentation as a final result. Labeling datasets is time consuming, besides, attributing characteristics to particular scenes is clearly difficult due to their nature. In this article, we will consider autoencoders application to unsupervised scene recognition and clusterization based on interpretable features. Further, we will focus on particular types of auto encoders that relevant to our study. We will take a look at the specificity of deep learning related to information theory and rate-distortion theory and describe the solutions empowering poor interpretability of deep learning in media content processing. As a conclusion, we will present the results of the work of custom framework, based on autoencoders, capable of scene recognition as was deeply studied above, with highlights generation resulted out of this recognition. We will not describe in detail the mathematical description of neural networks work but will clarify the necessary concepts and pay attention to important nuances.

Keywords : neural networks, computer vision, representation learning, autoencoders
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