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A Deep Learning Based Approach for Dynamically Selecting Pre-processing Technique for Images

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Abstract : Pre-processing plays an important role in various image processing applications. Most of the time due to the similar nature of images, a particular pre-processing or a set of pre-processing steps are sufficient to produce the desired results. However, in the education domain, there is a wide variety of images in various aspects like images with line-based diagrams, chemical formulas, mathematical equations, etc. Hence a single pre-processing or a set of pre-processing steps may not yield good results. Therefore, a Deep Learning based approach for dynamically selecting a relevant pre-processing technique for each image is proposed. The proposed method works as a classifier to detect hidden patterns in the images and predicts the relevant pre-processing technique needed for the image. This approach experimented for an image similarity matching problem but it can be adapted to other use cases too. Experimental results showed significant improvement in average similarity ranking with the proposed method as opposed to static pre-processing techniques.

Keywords : deep-learning, classification, pre-processing, computer vision, image processing, educational data mining
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