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Automated Near-Duplicate Image Detection using Sparrow Search Algorithm with Deep Learning Model

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Abstract: Recently, automatic Near-Duplicate (ND) imaging pair recognition by utilizing computer vision and pattern detection machinery has attracted extensive interest, but it has significant possible values within the application of image copyright violation recognition, management of device hardware stored, fake image recognition, and automated automobile driving. A common human-crafted local factor-based method like extremely implemented Histograms of Oriented Gradients (HOG) methods, achieves the image-level factors by integrating manners, like Vectors of Locally Aggregated Descriptors, fisher vector, Scale-Invariant Feature Transform, and so on. These approaches are affected by the difficulty of complex extraction steps and restricted representation capabilities. Most recently, because of the excellent feature learning skill of Convolutional Neural Network (CNN), scientists have employed CNN to manage the ND image pair recognition problem. In this aspect, this study presents an automated ND Image Detection by utilizing a Sparrow Search Algorithm with Deep Learning (NDID-SSADL) model. The objective of the NDID-SSADL model is to accomplish accurate and automated recognition of ND images. To achieve this, the AVPR-SSADL methodology employs a Gaussian Filtering approach for image pre-processing. For learning complex and intricate features, the Inception v3 feature extractor is used with an SSA-based hyperparameter optimizer. Finally, Manhattan distance-based similarity measurement can be used for the recognition of ND images. The experimental analysis of the NDID-SSADL methodology on the benchmark dataset exhibits a maximum achievement of 94.50% over the compared methods.

Keywords: Near Duplicate, Deep Learning, Image Detection, Sparrow Search Algorithm, Manhattan Distance.