

Siamese Neural Network & Computer Vision for Detecting Single Shot Image

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Abstract

The purpose of this research paper is to explore the innovative use of Siamese Neural Networks (SNNs) for Single Shot Image Recognition, which is very important in the field of computer vision. Traditional image recognition systems consume many datasets for supervised algorithms, thereby resulting in poor recognition of new or unusual objects. In discrepancy, Siamese Neural Networks are designed to learn one axis or multiple axes. Our approach uses a Siamese Neural Network framework to recognize objects or patterns with the use of only one reference image. This framework consists of two weight participating neural networks that take binary input images i.e., the reference and query images, and cipher a similarity score. Siamese Neural Networks learn to reduce the distance of features for the same image, while adding it for different images. The design covers important aspects such as data processing, model framework design, and optimization ways for dependable and effective recognition. We also study data addition, training, and various enhancement ways to enhance the conception capability of the model. The results show the effectiveness of Siamese Neural Networks in Single Shot Image Recognition, enabling accurate recognition indeed with only one reference image. This approach finds operations in retrieval of images, security, robotics, and scripts where fast and accurate recognition of limited visual data is a must-have. Using a Siamese Neural Network, we can achieve better results with limited training data as compared to traditional image recognition systems which uses a large number of datasets.

Keywords

SNN, CNN, Image Recognition, Detection