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Detecting Manipulated Media Using Deep Capsule Network

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Abstract : The ease at which manipulated media can be created, and the increasing difficulty in identifying fake media makes it a great threat. Most of the applications used for the creation of these high-quality fake videos and images are built with deep learning. Hence, the use of deep learning in creating a detection mechanism cannot be overemphasized. Any successful fake media that is being detected before it reached the populace will save people from the self-doubt of either a content is genuine or fake and will ensure the credibility of videos and images. The methodology introduced in this paper approaches the manipulated media detection challenge using a combo of VGG-19 and a deep capsule network. In the case of videos, they are converted into frames, which, in turn, are resized and cropped to the face region. These preprocessed images/videos are fed to the VGG-19 network to extract the latent features. The extracted latent features are inputted into a deep capsule network enhanced with a 3D -convolution dynamic routing agreement. The 3D –convolution dynamic routing agreement algorithm helps to reduce the linkages between capsules networks. Thereby limiting the poor learning shortcoming of multiple capsule network layers. The resultant output from the deep capsule network will indicate a media to be either genuine or fake.

Keywords : deep capsule network, dynamic routing, fake media detection, manipulated media
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