졸업논문 소개

영상의 적대적 공격에 대응가능한 강인한 오픈셋 학습 방법

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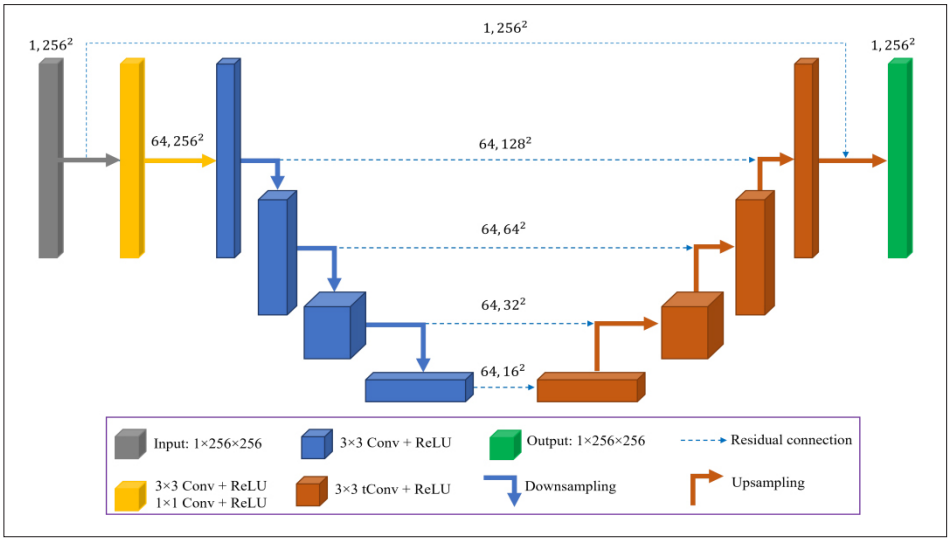
In recent times, digital image forensics is gaining increased attention in multimedia forensics owing to the widespread scam alertness. Anti-forensic (AF) attacks on manipulated images, particularly generative adversarial network (GAN), have been successfully applied to delude forensic methods. Consequently, a robust counter-AF (CAF) method is required to secure the integrity of digital images.

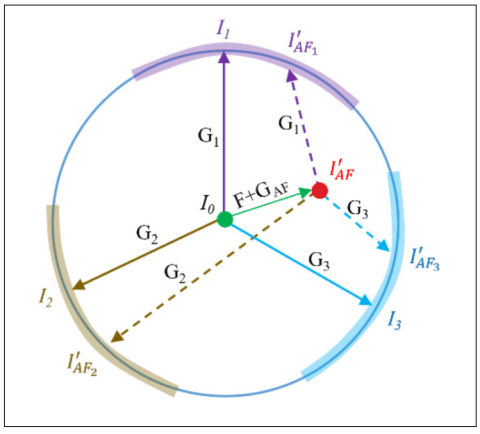
In this study, we propose a robust open-set multi-instance learning by introducing additional GAN-based operations. In details, we introduce double GAN-based operations to detect AF images in which additional



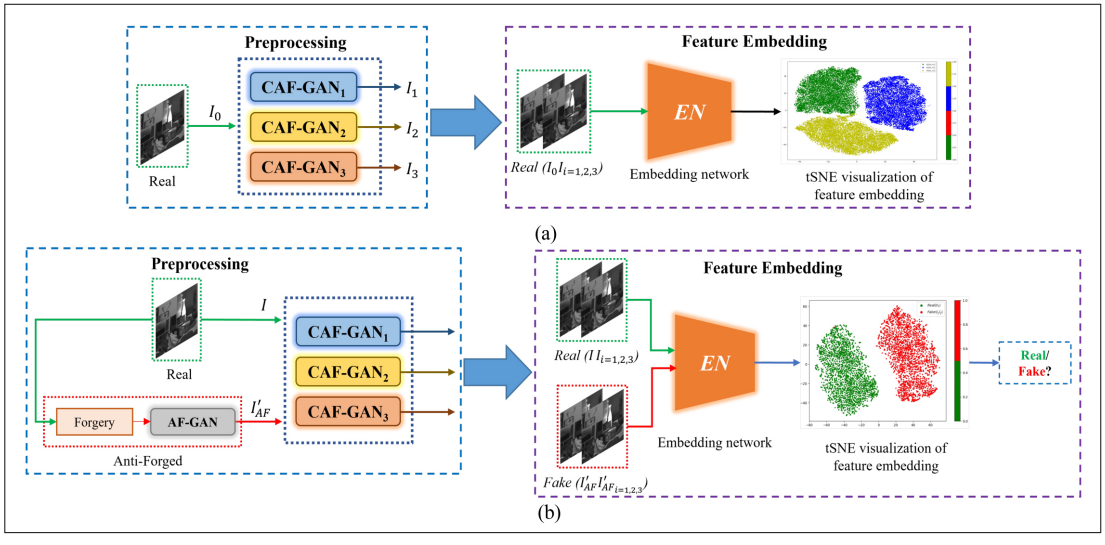
<Fig. 1> The architecture of the proposed CAF-GAN

GAN-based operations were purposely applied using multiple CAF-GAN models in 〈Fig. 1〉 The generator models vary based on the number of parameters and produce three different real-generated images that are projected onto three different generated image spaces marked in blue, yellow, and purple in 〈Fig. 2〉. Finally, the input and CAF-GAN generated images are concatenated for the final decision.

The proposed CAF was divided into two phases: training and testing. In the training phase, the embedding network learns only real images as shown in 〈Fig. 3〉 (a). In testing phase, both the real and AF images were processed to distinguish between them as shown in as shown in 〈Fig. 3〉 (b). The proposed method exhibited promising performance and robust against transferable updating AF attacks.



<Fig. 2> Working principle of the proposed open-set CAF



<Fig. 3> The architecture of the proposed open-set CAF method: (a) training scenario of the embedding network to learn multiple instances of real images in open-set fashion and (b) testing scenario of real and AF images which do not appear in the training

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