

CLAIMS

What is claimed is:

1. A computer-executed method for enhancing a vehicle damage image, the method comprising:

obtaining, by a computer, a first vehicle damage image; and

inputting the first vehicle damage image to a pre-trained generative adversarial network (GAN) model to obtain a second vehicle damage image, which has a better quality than the first vehicle damage image;

wherein the pre-trained GAN model comprises a pre-trained generative model and a pre-trained quality discriminative model configured to determine whether an image is a high-quality image;

wherein the pre-trained quality discriminative model is obtained by training a classification model using a plurality of positive samples comprising high-quality vehicle damage images and a plurality of negative samples comprising low-quality vehicle damage images; and

wherein the pre-trained generative model is trained using at least a plurality of low-quality vehicle damage images and the pre-trained quality discriminative model.

2. The method according to claim 1, wherein at least one of the following of the first vehicle damage image is of low quality: color, texture, brightness, contrast, saturation, clarity, and smoothness.

3. The method according to claim 1, wherein a distortion degree of the second vehicle damage image with respect to the first vehicle damage image is less than a predetermined threshold.

4. The method according to claim 1, wherein the GAN model further comprises a pre-trained distortion degree discriminative model configured to determine a distortion degree

of an output image of the generative model with respect to a corresponding low-quality vehicle damage image, and wherein pre-training the generative model in the GAN model further comprises: training the generative model based on at least the plurality of low-quality vehicle damage images and the distortion degree discriminative model.

5. The method according to claim 4, wherein the distortion degree discriminative model comprises a semantic recognition model and a reconstruction model, wherein the reconstruction model is a deconvolution model of the generative model, and wherein pre-training the generative model further comprises:

inputting the output image of the generative model into the reconstruction model to obtain a reconstructed image;

inputting the reconstructed image and the corresponding low-quality vehicle damage image respectively into the semantic recognition model to determine a semantic similarity between the reconstructed image and the corresponding low-quality vehicle damage image; and

determining the distortion degree of the output image with respect to the corresponding low-quality vehicle damage image on the basis of the semantic similarity.

6. The method according to claim 5, wherein the semantic similarity between the reconstructed image and the corresponding low-quality vehicle damage image comprises one or more of: a similarity in vehicle part, a similarity in vehicle model, and a similarity in vehicle damage.

7. A computer-executed apparatus for enhancing a vehicle damage image, comprising:

an image-acquisition unit, configured to acquire a first vehicle damage image;

a pre-trained generative adversarial network (GAN) model configured to generate a second vehicle damage image based on the first vehicle damage image, wherein the second vehicle damage image has a better quality than the first vehicle damage image, wherein the pre-

trained GAN model comprises a pre-trained generative model and a pre-trained quality discriminative model configured to determine whether an image is a high-quality image;

a first training unit configured to pre-train a quality discriminative model by training a classification model using a plurality of positive samples comprising high-quality vehicle damage images and a plurality of negative samples comprising low-quality vehicle damage images; and

a second training unit configured to pre-train a generative model using at least a plurality of low-quality vehicle damage images and the pre-trained quality discriminative model.

8. The apparatus according to claim 7, wherein at least one of the following of the first vehicle damage image is of low quality: color, texture, brightness, contrast, saturation, clarity, and smoothness.

9. The apparatus according to claim 7, wherein a distortion degree of the second vehicle damage image with respect to the first vehicle damage image is less than a predetermined threshold.

10. The apparatus according to claim 7, wherein the pre-trained GAN model further comprises a pre-trained distortion degree discriminative model configured to determine a distortion degree of an output image of the generative model with respect to a corresponding low-quality vehicle damage image, and wherein, while pre-training the generative model in the GAN model, the second training unit is further configured to: train the generative model using at least the plurality of low-quality vehicle damage images and the distortion degree discriminative model.

11. The apparatus according to claim 10, wherein the distortion degree discriminative model comprises a semantic recognition model and a reconstruction model, wherein the reconstruction model is a deconvolution model of the generative model, and wherein, while pre-training the generative model, the second training unit is further configured to: input the output image of the generative model into the reconstruction model to obtain a

reconstructed image; input the reconstructed image and the corresponding low-quality vehicle damage image respectively into the semantic recognition model to determine a semantic similarity between the reconstructed image and the corresponding low-quality vehicle damage image; and determine the distortion degree of the output image with respect to the corresponding low-quality vehicle damage image on the basis of the semantic similarity.

12. The apparatus according to claim 11, wherein the semantic similarity between the reconstructed image and the corresponding low-quality vehicle damage image comprises one or more of:

a similarity in vehicle part, a similarity in vehicle model, and a similarity in vehicle damage.

13. A non-transitory computer-readable storage medium storing instructions that when executed by a computer cause the computer to perform a method for enhancing a vehicle damage image, the method comprising:

obtaining a first vehicle damage image; and

inputting the first vehicle damage image to a pre-trained generative adversarial network (GAN) model to obtain a second vehicle damage image, which has a better quality than the first vehicle damage image;

wherein the pre-trained GAN model comprises a pretrained generative model and a pre-trained quality discriminative model configured to determine whether an image is a high-quality image;

wherein the pre-trained quality discriminative model is obtained by training a classification model using a plurality of positive samples comprising high-quality vehicle damage images and a plurality of negative samples comprising low-quality vehicle damage images; and

wherein the pre-trained generative model is trained using at least a plurality of low-quality vehicle damage images and the pre-trained quality discriminative model.