Response to Reviewer 4 Comments

This manuscript presents the review of Conditional Generative Adversarial Networks (CGAN) for Domain Transfer. This manuscript is well presented and informative. However, several issues need to be clarified before it can be accepted for publication.

1. Why chose Conditional Generative Adversarial Networks (CGAN) as a method that was reviewed in this manuscript? Explain it in detail in the introduction.

Response: Thanks for your comments very much. We have explained the reasons with red fonts. The revised parts are "With the assistance of CGAN, domain transfer can be easily applied into different application scenarios. Therefore, this article will review the problems of domain transfer based on CGAN. In fact, CGAN could also be used to another application fields, such as data augmentation, image inpainting and so on. While their principles are similar, so it is very necessary to make a review on CGAN." and "At present, a large amount of surveys have summarized the models of GANs, but few of them concentrated on the topic of CGANs in domain transfer. Therefore, this paper will first summarize the researches on CGAN and further discuss the problems and challenges facing of it, aiming to encourage more researchers to develop CGANs."

2. This manuscript only focuses on Domain Transfer. The authors need to explain this in detail.

Response: Thanks for your comments very much. We have explained the reasons with red fonts in the introduction. "Generally speaking, domain transfer is the process of moving data from one domain to another, by learning the similarities between these two domains and building a bridge between them, to apply the old knowledge into the new domain, so that the new knowledge can be learned faster and better. It can further address the image/scene gap when training and practically applying."

3. Font color in lines 194-199 is blue. Is there any meaning to this?

Response: Thanks for your comments very much. We are sorry for that. The blue part is the revised part before and no other meanings. We have removed the color.

4. Summary of several types of research has been presented in the table. But several of the only written in text. It would be better if all of the research are presented in tables or figures.
Response: Thanks for your comments very much. We have added the references in table 3 and added a new table 5 to summarize the research of all application fields. As follows:

Table 3. A summary of various evaluation methods

Type	Index	Description
Automatic evaluation	IS [23,45,56,58–60]	Mapping the evaluation task to a classifier.
	FID [23,45,57–60]	Using the Inception network to extract features from an intermediate layer.
	TARR [61].	Computing the recognition rate of attributes on synthetic data by a model trained on real data.
	PSNR[41]	Computing an expression for the ratio between the maximum possible value (power) of a signal and the power of distorting noise that affects the quality of its representation.
	SSIM [62]	Measuring the similarity between the two images.
	Dice [35,63][58,61,64,65]	Measuring the gap between the semantic segmentation result and the real result.
	R-Precious [45]	Retrieving the relevant text for a given image query.
Manual evaluation	Sample Analysis [23,61,64]	Analysing some typical generated images qualitatively.
	Evaluator Tests [23,35,35,64,65]	Inviting some reviewers to identify the real image and the generated image.
	Simulative Recommendation [60]	Ranking the images from different sources under the given conditions.

Table 5. A summary of CGANs in various application fields [A1]

Application fields	Task description	Typical papers
Super Resolution (SR)	Converting image from low resolution to high resolution	[17,26,28–36,36,37,72,76–86]
Image style transfer	Transforming one type of image into another style of image, such as color transformation, texture transformation, etc.	[15,18,25,27,35,38,39,62,87–89]
Feature synthesis	Combining separate features to make composite features	[19,34,38,40,41,61,61,71,90–92]
Image inpainting	Restoring the original appearance of the image	[20,20,75,93–96,96,97,97–101,101–105]
Pose transfer	Generating images of the object observed from another angles.	[21,106–113]
Image generation from text descriptions	Generating images according to text description	[16,43–45,58–60,60,114–116,116–121]
Another fields	Such as: single image dehazing, sequence labeling, inconsistency, etc.	[122–125]