Sensor Applications

Multi-view Scene Image Inpainting Based on Conditional Generative Adversarial Networks

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Manuscript received June 7, 2017; revised June 21, 2017; accepted July 6, 2017. Date of publication July 12, 2017; date of current version July 12, 2017.

Abstract—Multi-views systems have been widely used in robots, ADAS(Advanced Driver Assistance Systems), monitor systems and so on, using multi-views, the machine can better perceive the surrounding scenes. The exposed lens and the camera are easily contaminated by the outside, resulting in abnormal images. Image inpainting technology can utilize the prior information of the image structure, texture and other information provided by the surrounding pixels of the abnormal area to recover the damaged image, which can reduce the loss of visual information, providing as much information as possible for the machine's decisions. In order to achieve the above purposes, considering the characteristics of multi-vision system, a novel image inpainting method is proposed. The basic idea is that using conditional generative adversarial networks(CGAN) to amend defect images, in which the priori condition is the synchronization frame from other cameras in different viewpoints. The generator in the CGAN is a autoencoder which has skip connected from encoder to decoder. We also integrate spatial transform networks, group convolution and channel switching technology in our network structure to better fusion the multi-views information. Experimental results show the advantage of our method.

Index Terms—Image inpainting, generative adversarial networks, convolutional neural network, deep learning.

I. INTRODUCTION

Image inpainting means to restore the defective image according to the image texture, structure and other information. It has been broad applied in many field, such as defect images restoration[1], [2], video communication error repairing[3], [4] and photo editing[5], [6]. With the development of image and video processing technology, visual information has played a key role in the field of automation. Due to the limited information available from monocular cameras, the multi-views system is widely used.

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I wish you the best of success.

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July 12, 2017

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II. CONCLUSION

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Associate Editor: Alan Smithee.
Digital Object Identifier 10.1109/LSENS.2017.0000000

ACKNOWLEDGMENT

This work was supported by the IEEE. The authors would like to thank ... Note that the Acknowledgment section of *IEEE Sensors Letters* is rendered in scriptsize.

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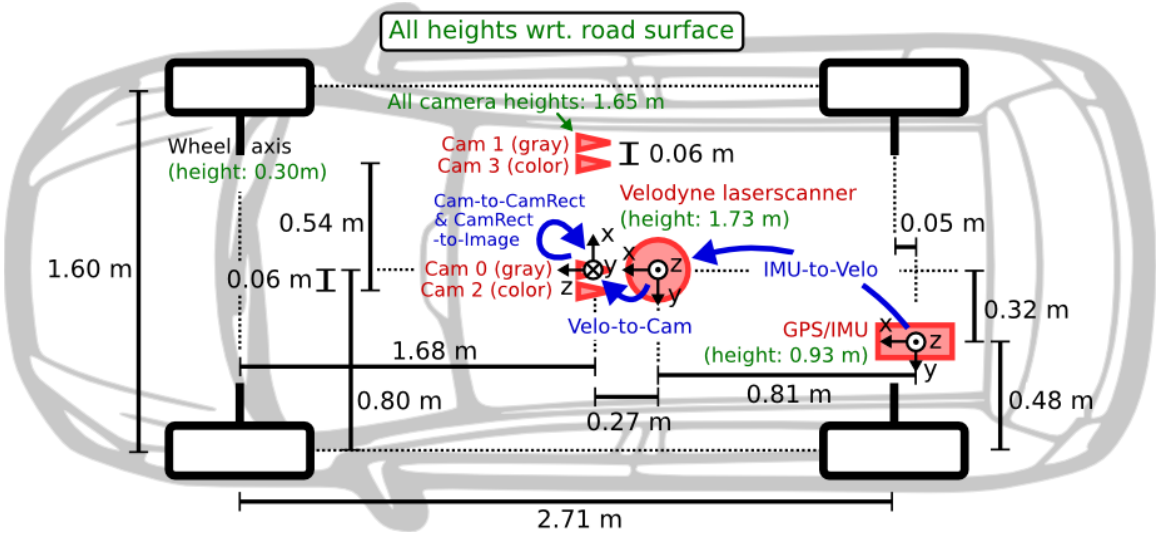

Fig. 1. A vehicle equipped with four cameras(Cam0~Cam3).