

(54) Title of the invention : AUTOMATIC GENERATION OF SEGMENTED LABELS FOR ROAD ANOMALY DETECTION: A ROBOTIC APPLICATION

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(57) Abstract :

Robotic Applications as robotic wheelchairs are designed to improve the life quality of the disabled or elderly people by increasing their mobility. To this end, autonomous navigation has been intensively studied and become an essential capability for robotic wheelchairs. The segmentation of drivable areas and road anomalies refers to pixel-wisely identifying the areas and anomalies in images. It is a crucial component for autonomous navigation. Without correctly segmenting drivable areas and road anomalies, robotic wheelchairs could bump or even roll over when passing through road anomalies, which may cause injuries to human riders. In this paper, we define the drivable area as the area where robotic wheelchairs can pass through regardless of their sizes, while the road anomaly is defined as the area with the height larger than 5cm from the surface of the drivable area. The segmentation of drivable areas and road anomalies could be addressed using semantic segmentation techniques. The proposed method develops the solution of this problem for the task of drivable area and road anomaly segmentation by proposing a self-supervised learning approach. The proposed method can automatically generate segmentation labels for drivable areas and road anomalies. Then, we train RGB-D data based semantic segmentation neural networks and get predicted labels. Firstly, develop a pipeline named Self-Supervised Label Generator (SSLG) to automatically label drivable areas and road anomalies. Then, used the segmentation labels generated by the SSLG to train several RGB- D data-based semantic segmentation neural networks.

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