

Construction of 3D Measurement for Road Alignment by Multiple Photographing for Making Hazard Map of Traffic Accident

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Measurement of road alignment, such as longitudinal slope and curvature of left and right curves, is necessary to evaluate accident risk on hilly and mountainous roads. In this study, authors devised a three-dimensional modeling method of roads by taking photographs from multiple points, and constructed a method that can efficiently measure road alignment and evaluate accident risk for hazard maps of traffic accident on hilly and mountainous roads. As shown in Figure 1, a rotating head and two cameras which were set on the roof of a vehicle were developed. Using this photographic equipment, the road was repeatedly photographed from a height of 2.2 m at a vehicle speed of 30 km/h, and numerous photos were taken. As a result, good 3D models were constructed in sunny areas as shown in Figure 2. However, 3D models in some shady areas were not so good. In addition, there was an effect of deterioration of model quality due to simultaneous shooting by multiple cameras. It is necessary to further improve the modeling method in order to achieve stable modeling, especially for shady areas, including the method of onboard photographing with a single camera.



(a) Overall view

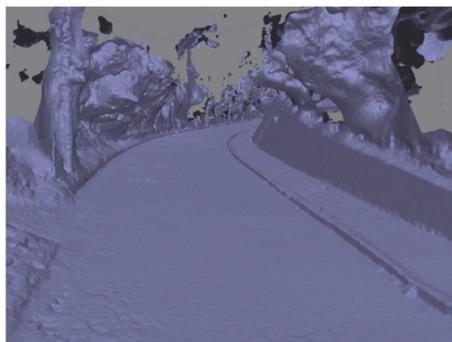


(b) Zoomed view

Fig.1 On-board photographic equipment



Texture



Solid model

Fig.2 3D models using this method (using 7 round-trips photos)