Automatic Obstacle Removal for On-Vehicle Video using Spatiotemporal Analysis

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In this research, the method which can automatically remove objects, such as pedestrians, telegraph poles, roadside trees, etc., from the on-vehicle video camera is proposed; such images are widely used for urban scene modeling (e.g. Google Street View), and a removal of these objects now becomes a critical issue. Since an input data is a video stream and an urban scene is mainly composed of planar surfaces parallel to the street, the method can effectively remove the objects by using the spatiotemporal image analysis. To show the strength of the method, several experiments using real data are conducted, which resulted in a successful removal of complicated objects.

Publication

System Overview

Input video stream captured by on-vehicle camera. Obstacle masking by optical flow. Objects in the foreground have larger flows.

Masked EPI

Estimate the “dominant angle” of the edges outside the masked region, and define a set of interpolation lines based on the angle. Then, inpaint the masked region by the most frequent color on the interpolation line.

Output.

Experiment

Our experimental car for capturing in city area. Result in the urban scene.

Appendix

Epipolar Plane Image
Automatic Separation of foreground objects and texture planes
from On-Vehicle video using plane structure

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In the urban scene modeling, separation of foreground objects (e.g. pedestrians, telegraph poles, roadside trees, etc.,) and texture planes of buildings is important problem for 3D reconstruction and privacy, etc. We propose the method which can automatically separate foreground objects and texture planes for such problem from the on-vehicle video data. Since an input data is a video stream and an urban scene is mainly composed of planar surfaces the method can effectively separate the objects by using the spatio-temporal image analysis. To show the strength of the method, several experiments using real data are conducted, which resulted in a successful separation of complicated objects.

Publication


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