Abstract

The essence of an image is a projection from a 3-D scene onto a 2-D plane, during which the depth information is lost. The 3-D point corresponding to a specific image point is constrained to be on the line of sight. From a single image, it is very difficult to determine the depth information of various object points in an image. If two or more 2-D images are used, then the relative depth point of the image points can be calculated which can be further used to reconstruct the 3-D image by projecting the image points which includes the depth information as well. This paper presents two techniques namely binocular disparity and photometric stereo for depth calculation and 3-D reconstruction of an object in an image as it requires minimum user intervention. Binocular disparity method requires a pair of stereo images to compute disparity and depth to generate the desired 3-D view whereas the photometric stereo method requires multiple images under different light directions.
An Approach to Calculate Depth of an Object in a 2-D Image and Map it into 3-D Space

- Assoc. Prof. Dr. Ir. E. A. Hendriks Dr. Ir. P. A. Redert, "Converting 2-D to 3-D: A Survey," Information and Communication Theory Group (ICT) Faculty of Electrical Engineering, Mathematics and Computer Science Delft University of Technology, the Netherlands, December 2005.
An Approach to Calculate Depth of an Object in a 2-D Image and Map it into 3-D Space

- Dr. SukhenduDas. “Computer Vision (CS 635), Shape from Shading.” Available online at http://www.cse.iitm.ac.in/~vplab/courses/CV_DIP/PDF/ShapeFromShading.pdf

Index Terms

Computer Science          Image Processing

Keywords

Feature point   Binocular disparity   Edge detection   Depth   Photometric stereo
Normal map

Highlight.