
Project Proposal

Depth map generation
from single image

Overview

Github:

<https://github.com/ksubbu199/Depth-Map-With-Single-Image>

Team members

- Y V S Harish
- Subrahamanyam Varma

Main Goal

Fully automatic technique to estimate depth information from a single input image. (Depth-Map Generation by Image Classification)

Problem definition

A few methods have been proposed to change over existing 2D pictures to 3D pictures. Much of the time these strategies are self-loader : in a reasonable administrator recognizes objects for profundity arrangement in the 2D picture while in an enhancements craftsman manages the age of profundity maps utilizing a Machine Learning Algorithm. Different strategies, in light of the movement of the articles in respect to the camera, have been proposed to figure profundity maps by assessing and breaking down optical stream. Another class of calculations utilizes center and defocus data.

This project aims at a method based on a novel image classification technique able to classify digital images as indoor, outdoor with geometric elements or outdoor.

Method (How things will be done ??..)

- Bayer to approximated-RGB color conversion
 - Color-based segmentation
 - Rule-based regions detection to find specific areas
 - Image classifications to discriminate between outdoor with or without geometric elements and indoor images.
 - Approximated depth map estimation.
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What will be done ??..

- 1) Implement the techniques used to extract some specific features from the input image.
 - 2) Image classification .
 - 3) Depth map estimation .
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Expected results



Input



Output

Expected results



Input



Output

Topic Division

Y V S Harish : (Will implement the following)

- Region Detection for feature extraction.

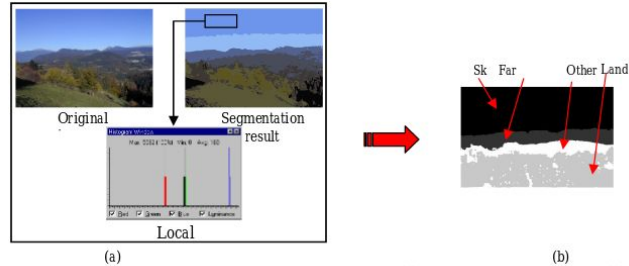


Figure 3 - Example of the heuristic rule to classify the sky region (a); result of the detected regions (b)

- Vanishing lines detection.

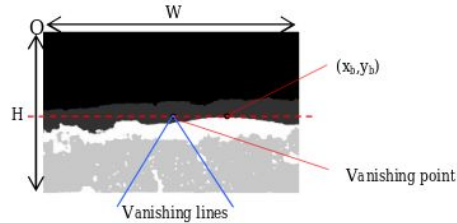


Figure 9 - The boundary point and the resulting vanishing point for *Outdoor* images.

Y V S Harish : (Will implement the following)(Contd.)

- Gradient Planes generation.

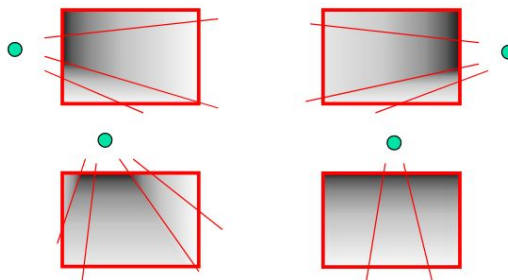


Figure 11- Examples of the heuristic rules to generate depth gradient planes: the green circle represents the vanishing point.

- Depth Map generation by fusion

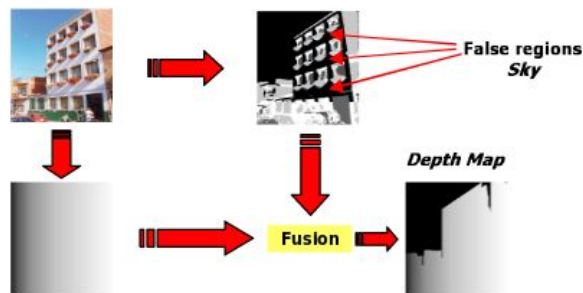


Figure 14 - Examples of depth map generation by fusion.

Subrahmanyam Varma : (Will implement the following)

- Macropixel Bayer to RGB color conversion

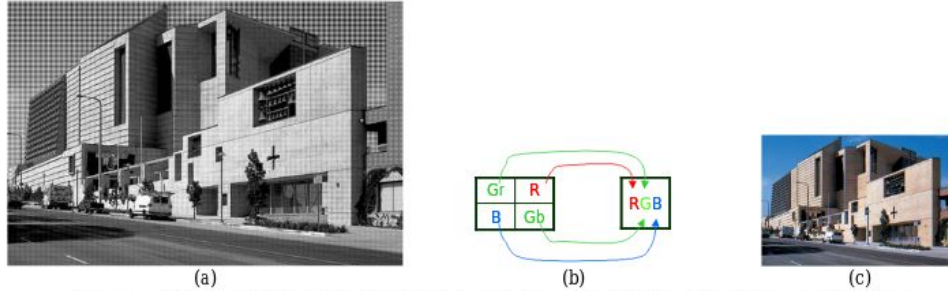


Figure 1 - Bayer Pattern image (a); Macropixel interpolation (b); RGB image after color recovery (c).

- Color-based segmentation



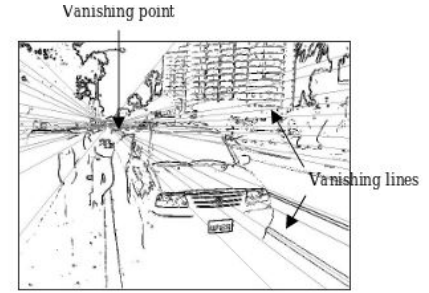
Figure 2 - Original Image (a); Under segmentation image (b).

Subrahmanyam Varma : (Will implement the following)(Contd.)

- IMAGE CLASSIFICATION



(a)



(b)

Figure 10 - (a) Input image classified as Outdoor with Geometric appearance, (b) Result of vanishing lines detection.

- Depth gradient assignment
 - Consistency verification of detected regions
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Project Milestones

Image Pre processing

- Macropixel Bayer to RGB color conversion
- Color-based segmentation
- Regions detection

Depth - Map Generation

- Vanishing lines detection .
- Gradient planes generation .

Final Presentation



Image Classification

Depth - Map Generation

- Depth gradient assignment
- Consistency verification of detected regions
- Depth map generation by fusion