

# Approach of coloring scheme in Identification of doohickey

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**Abstract**-Deterrent recognition is a principle key of autonomous frameworks. For the situation when speaking with immense robots in unstructured foundation, versatile impediment identification is required. The strategies are for the most part suited for foundation in which the ground is nearly level and of generally a similar shading. The strategy utilizes an accommodating monocular camera, performs progressively, and produces a twofold impediment picture at high resolutions. We utilize the strategy like the homography between two edges caught from the progression and after that build up a precise calculation for the count so that the centroid of the distinguished protest is triangulated in order to assess the separation. We inspect a trouble characteristic for any homography-based viewpoint to the gave errand, and show how the talked about way can find this trouble to an enormous level. A snag framework in view of visual specific trait and stereo vision is communicated.

*Keywords: Image Segmentation, Centroid, Thresholding, Fundamental Matrix calculate and Triangulation.*

## **INTRODUCTION:**

As the technology increases day by day difficulties also increases with respect to safety in any path between object and obstacle, so obstacle detection is the methodology that refers to ability to detect the obstacle that appears in between the desired destination or any other object. Obstacle detection is a methodology that helps to human-being, vehicles; robots etc. to take decision so that they can be save when there is any obstacle in their path. Generally an obstacle is a thing, condition that creates barrier. Any impediment is planned to stop, halt, and turn the movement of an opposing force. An obstacle can be natural or it can be made by any man or it may be that it is combination of both. So there are many type of obstacle such as physical, political, economic. Before sometimes, generally when use hardware and white cane to detect any obstacle so there occur some problem with these methods. Because hardware uses sensors to detect obstacle and sensors are very costly i.e. economically problem and other problem of sensor requires computationally very high to detect. The problem of second one is that it cannot detect overhanging obstacle so this is not also feasible. So color based technique is a solution to above problems. The main objective of this work is to detect the obstacle on the basis of color cue. Any obstacle is detected by its color and position from monocular camera. Position can be calculated by distance. Other proposed algorithm has

developed on the basis of color only. Triangulation method in this work will help detect the orientation of two frames of same image so that distance can be detected .So distance between one of the frame and camera can be evaluated. Take two images from camera and segment it into Taking Centroid for two consecutive frames so that can be detect the orientation of camera or some changes that can be held due to noise. This work describes an obstacle detection algorithm for use in relatively flat areas where there is similarity in color. In computer vision triangulation refers to the process of determining a point in 3D space given its projections onto two, or more, images. This point is an interested point of two frames of same image. Triangulation is a MATLAB library which computes a triangulation of a set of points in 2D, and computes any other operation in the form of sparse matrix on triangulations of order 3.The mesh is the collection of triangles. Each triangle in this mesh is known as elements. This model typically calculates the position of obstacles according to a monocular camera by using range information. If the obstacle is in range then unnamed vehicle or human-being can take decision to turnRange information may be collected from sensors or vision based techniques. We prefer vision based techniques. Vision based has advantages over other technique:

1. Vision based techniques has low cost compare to others.
2. It has low power consumption so that it requires less computational as compare to laser.
3. It has highest point of accuracy.

There is image segmentation, help to segment the image from background. Thresholding is a way in which can convert an image into grey scale image. So this will give background information to detect obstacle. In this paper, Section 2 describes related work or Literature study. Section 3 describes motivation. Section 4 describes problem statement. Section 5 describes innovative content. Section 6 describes assumption of obstacle detection. Section 7 describes methodology.

## 2. RELATED WORK

This section gives an overview of the related research that has been done in respect of obstacle detection based on color cue till now. Basically the domain of literature survey is the approach used for obstacle detection in computer vision. Following is the existing work done by the researcher in context of their interest:

[1] Tells about the fast color image segmentation for robots. It describes vision systems employing region segmentation by color are crucial in real-time mobile robot applications. Generally systems involving priority wise color-based segmentation are either executed in hardware, or extremely important software systems that retrieve the gain of domain information to achieve the better efficiency. However; we have found that with careful achieve to algorithm efficiency, obstacle detection can be done using image capture and CPU hardware [1].

[2] Proposed a technique for appearance based obstacle detection. Wan has developed a new appearance-based obstacle detection system that is based on passive monocular color vision. The main point of this technique is to segregate from the ground on the basis of appearance and then denoting them as obstacles. Range sensors are also unable to differentiate between various forms of Parag H. Batavia and Sanjiv Singh [3] purposed Obstacle Detection Using Adaptive Color Segmentation and Color Stereo homography. The view of author behind color segmentation for obstacle detection is that pixels in an image are notified as obstacle or free space on the basis of color.

The idea of homography is that general stereo cameras are used to find range to images and It requires high computationally cost. So there is another way to find

The important step in [1] used approach is to classify each pixel in an image into one of an individual number of color classes. This approach to complete the obstacle detection includes four tasks. These tasks are linear color thresholding, nearest neighbor classification, color space thresholding and probabilistic method [1].

The technology in this system is as following:

1. An implementation of a threshold identifier.
2. Grouping system to form regions through connected components.
3. Segregation and sorting system that collects many region features, and a top down merging heuristic to approximate perceptual grouping.

[1] Showed results about image segmentation that first execution was a rules which are set of autonomous robots on the behalf of Probotics Cye platform. And it depends on Uclass [11], Vclass [11] and Yclass[1].In its present model the system can process 320x240 images at 30 Hz with 25% utilization of the 375 MHz CPU.

[1] Approach includes the use of thresholds in a three dimensional color space. Various color spaces are in mostly use, including Hue Saturation Intensity (HSI), YUV and Red Green Blue (RGB).

[1] A 3-D region of the color space for classification is represented as a grouping of three binary functions. These three functions are

Pixel-in-class = YClass[Y]  
AND UClass [U]  
AND VClass [V];

ground surfaces. This is a problem with sensors so [2] gave solution hence obstacle detection system is purely based on the appearance of individual pixels.The approach used in [2] has number of assumption so that it can handle

Iwan gave experimental result in which give Input color image with trapezoidal reference area and give output as Binary obstacle image

obstacle i.e. homography. It is linear in the number of pixel because it does not require any computationally cost.

[3] Discussed an approach for obstacle detection using color segmentation. Each pixel in image is denoted by 3-tuples i.e. Red, Green, Blue. In this model, several protocols would be used to classify pixels, for instance "If blue is between 125 and 170 and red is less than 20

and blue is more than 75, then termed as ground i.e. it is not obstacle

Parag has discussed training set which is represented by 2-D histogram. The bins in histogram are located on the basis of H and S values in the pixels of image. The values of the bin show the number of occurrences of that specific H and S pair in the training set. For each pixel in the training image, the value of that histogram bin is increased. After training, the system is ready to recognize pixels as obstacle or free space. For each pixel, p, in a test image. We look up the bin value of the respectively color of p. It gives a probabilistic measure, P, of that image. If P is larger than threshold then it is assumed as free space else it is considered as an obstacle.

Parag [3] purposed a figure in which discuss the result of purposed algorithm.

Image to be tested  
Histogram Obstacle image

Testing

Another way is to use nearest neighbor classification. To classify a new pixel, a list of the K nearest essence is found, and then the pixel is classified according to the largest ratio of categorizing of the neighbors [4].

Another approach [5] is to use a set of constant thresholds defining a color class as a rectangular block in the color space. This technique provides well performance, but is not able to retrieve gain of prospects dependencies between the color space dimensions.

H.R. Everett [6] purposed a technique in which it can be detect the position of autonomous system and sensor. While a huge part of work exists for range-based obstacle detection, little work has been done in appearance based obstacle detection.

Table 1.

No.	Algorithm proposed by	Idea	Limitation
1.	James Bruce ,Tucker Balch and Manuela Veloso [1]	This paper describes a system which is able of following various number of regions of up to 32 color at 32 Hertz on common commodity hardware	This system operates on images only in color space and each pixel has been defined up to only 32 colors.
2.	Iwan Ulrich and Illah	The idea of this paper is to detect the	This paper defines algorithm

H.D.Cheng [7] purposed color image segmentation algorithm. Basically approaches are based on monochrome segmentation approaches operating in different color space. For example histogram Thresholding, edge detection, feature clustering, fuzzy technique etc.

Richard I. Hartley [8] developed a technique for obstacle detection based on Triangulation. In this paper they consider the problem of finding the position of a point in space given its position in two images taken with cameras with known calibration and pose. This process requires the intersection of two known rays in space and is commonly known as triangulation.

Active vision for the visually impaired, financed by the Portuguese Foundation for Science and Technology, combines several technologies, such as GPS, GIS, Wi-Fi and computer vision, to create a system which helps the visually impaired to move in- and outdoor [9].

Cheng-Lung Lee [10] purposed an evaluation of a simple obstacle detection device for Blind people in which questionnaire survey for mobility needs was performed at the start of this study. After the detector was succeed, five blindfolded sighted and 15 blind peoples were invited to organize test under three terms: (1) using a white cane only, (2) using the obstacle detector only and (3) using both devices.

Long CHEN, Bao-long GUO, Wei SUN [12] discussed obstacle detection system for blind people on the basis of stereo vision method. In this discussed approach, two cameras are installed simultaneously and by making map of those images he applied segmentation for feature extraction. And he detected region of the images so that microphone can detect there is an obstacle.

Long CHEN described a system model for obstacle detection in fig 2.5.

	Nourbakhsh [2]	obstacle based on appearance so that obstacle can be differing from free space.	which is not relay on combination of all color space.
3.	Parag H. Batavia and Sanjiv [3]	The purpose of this paper is obstacle detection using color homography because it requires linear computational cost.	Homography approach is not limited to flat grounds. And it allows navigation system for small area only.

### 3. MOTIVATION

The motivation of our proposed technique is to overcome the problem of other existing technique so that robot, visually impaired people, vehicles etc. can detect an

obstacle in their way. And easily they can change their way. This motivation solves following problem:

- A. When there any two obstacle having same color then there will be conflict so we will propose an algorithm to solve this problem on the basis of distance calculation.
- B. Other existed technique does not provide any way to handle overhanging obstacle.

#### 4. PROBLEM STATEMENT

- C. Obstacle creates hindrance, in order to move freely obstacle detection algorithm plays a vital role. The present work intends to develop an obstacle detection algorithm that can detect obstacle based upon color cue.

#### 5. INNOVATIVE CONTENT

To solve the problem of other referred technique, this paper will discuss idea. And the idea of this paper Take two images from the camera and segment it into two categories 0 or 1. and calculate the centroid of two that frames and with the help of triangulation method calculate distance.

#### 6. ASSUMPTION OF OBSTACLE DETECTION

There are following assumption that assumed under the algorithm:

- 1) For the system we assumed, obstacles are limited to objects that are at minimum constant unit's height above the horizontal plane.
- 2) It is assumed that ground must be relatively flat so that obstacle can be detected.
- 3) Obstacles are assumed to be differentiable from the framework intensity in the image.

#### 7. METHODOLOGY

- 1) Image acquisition: It is process to take image from camera. So that applies further operation on those images to detect obstacle.
- 2) Image Segmentation: This technique is to use to divide images into parts to correlate between interested objects and rest of objects. This operation will be done on the pixels of images based on RGB values
- 3) Thresholding: It used because it helps to differentiate between obstacle and ground. It means for instance we say if value of the Red pixel is 220 and the threshold value is 128. And if the

value is greater than threshold then it is obstacle else it is free space.

- 4) Center Detection: It is compulsory to detect the center point of image so that we can apply triangulation method to calculate distance. Here we required to detect center of two frames of same image.
- 5) Fundamental Matrix calculate: Sometimes camera parameter for example focal length occurs some reflection in image if this parameters are known then fundamental matrix does not require else it requires. It collects the information of each pixel of input image in the form of two- dimensional.
- 6) Triangulation: This is most important because when the two rays projected on the camera then it gives a point where two rays of frames are intersected. So distance can be calculated from any one of the frame to camera.

#### CONCLUSION

We have presented a new system for real-time segmentation of color images. It can classify each pixel in a full resolution captured color image. Thresholding is the simplest method of image segmentation for a gray image; Thresholding can be used to create binary images. Obstacle can be detected by using color and distance based. Triangulation helps in estimating the distance of the object and hence the distance is found.

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