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Android Based Color Routing Wizard

Abin Joy [1], Ann Theresa Kenny [2], Nishal Govind K R [3], Namitha T N [4]
Research Scholar [1], [2] & [3], Assistant Professor
Department of Computer Science and Engineering
Jyothi Engineering College
Cheruthuruthy, Thrissur
Kerala – India

ABSTRACT
This paper facilitates a mobile robot vision system for object colour tracking. We aim at implementing a vision system of the robot that gives the robot ability to recognize the color and thus resulting in its corresponding movement. The implementation is carried out in two stages: color recognition, and routing the robot. Frequency of the particular color is fed as input to the microprocessor. Motion of the robot comprises of robotic head rotation and alignment of the robot. Routing the robot facilitates the robotic movement. Thereby we are design an efficient system for the movement of the robot using the color.
Keywords:- Robot vision, color tracking, robot navigation.

I. INTRODUCTION

In recent years we have seen a drastic change in industries approaches to use color tracking embedded systems to fulfill their needs for a higher production and precise quality. However, new technologies have been made available for the integration of color tracking with a vision system which are cost-effective solutions. The applications of color tracking vision systems are many and still increasing. In this paper we implement an embedded system that tracks colors which is controlled through an android application .Color is an environmental characteristic which provide information to a robot.

The deployment of color tracking systems is a challenging topic that has focused the interest of research institutions all across the world. Although several color tracking systems are available today, they do not provide the required efficiency and accuracy. This paper is brought up with an alternative solution to color tracking. Recent research in color tracking focused on programming within the chip, while we propose an android app for this purpose there by reducing the cost and complexity. Color tracking systems provides a wide variety of real time application.

II. RELATED WORKS

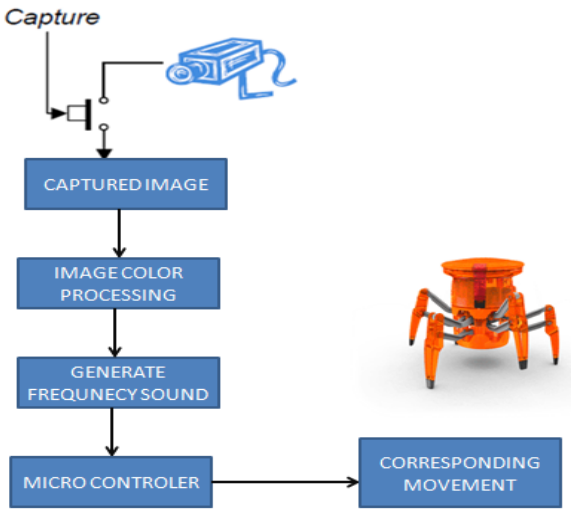
Color identification have vital role in many applications. Several methods are introduced for identifying accurate color. In [1] a new technique is developed for fast color object recognition that is suitable for use in robot platforms like the Segway . The key contribution of this approach is that it is able to adapt its segmentation process to different lighting conditions, within reason. In addition to being adaptive, this technique requires only moderate additional computational resources beyond existing fast color vision algorithms. Presented a new technique and provide empirical evidence of its performance using Segway RMP robot bases.

In [2] the system consists of a PIC controller interfaced with three IR sensors for detecting the direction of movement for the robot. These sensors will be detecting the color difference between the black and white for the smooth following of line. Further, an obstacle detector prevents the robot from hitting any obstacles by stopping the robot once any object is detected. The Controller takes action on the feedback from the sensors and accordingly the motors are

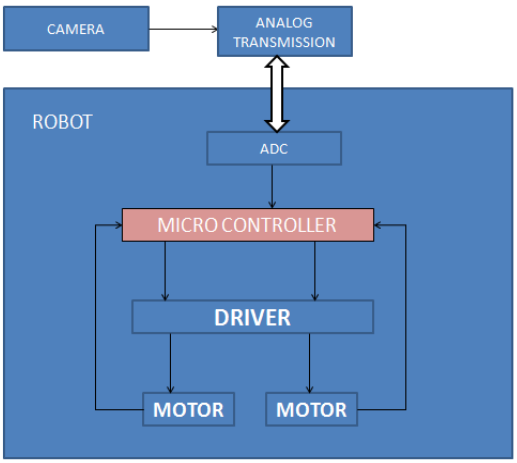
controller for forward, reverse or turning movements. The destinations in the track for robot are detected by using colored IR sensor, this sensor detecting green, blue, red and yellow. The Android mobile sends commands to the PIC Microcontroller using Bluetooth and UART communication. The controller then takes action depending on the command and directs the robot into the required Path.

III. OBJECT COLOR TRACKING

The process of detecting objects is to analyze the information in the image which enable to track color. Object recognition is based on the color. After the recognition the problem is to track these objects preserving their locations. In this section an object color tracking model will be introduced, the model integrates the detection and color tracking taking the advantages of the methods to optimize the processing time. The modified algorithm is implemented and tested under different conditions to verify its robustness and its validity in detecting objects.



HEXBUG SPIDER is an autonomous robot. It consists of two motors. First one control six legged crawling motion. Second one is to rotate its head on 360 degree.3AA-batteries set internal mechanisms in motion. Frequency counter is used to measure frequency. Frequency counters are basically simple counter system with a limited time period for counting.



The above diagram shows the overall view of the color tracking system. It uses a camera, basically an android phone camera to capture the image. An object color is identified by the android application and a corresponding analog signal is generated. This analog signal is fed to the ADC and a digital signal is obtained as output at the micro controller. The micro controller facilitates the control of the two motors using a driver circuit and helps in the navigation of the robot to the target.

IV. NAVIGATION & MOTION PLANNING

Color tracking robot is an embedded mobile system which works based on a android application. The embedded system consist of a Robot which identifies various colors and performs the corresponding movement for that particular color .The Robot is controlled using a Micro Controller Chip. The Chip contains a program that identifies different frequencies produced by the Android Application and perform the corresponding action specified for the particular frequency .The Android Application makes use of the mobile camera

which captures the image .The user can choose the desired color from the image and based on that color a particular frequency is created and sent to the chip.

V. SUMMARY & CONCLUSION

With the increasing demands of tracking systems, color tracking systems has recently gained more interest. The development of mobile robot vision systems has also assured the great achievement in this field. We have proposed a color tracking system using the combined concepts of robotics and app development in order to find the trajectory of an object .In the proposed robot vision tracking technology, the color is the most important information for identification and partition. At the same time, In order to improve the accuracy of identification in different illumination conditions an efficient color space is taken into account. The robot path planning is accomplished based on the color segmentation.

V. FUTURE WORK

We are planning to set up a database with more subjects and variations in conditions. In the proposed method, any object could be recognized based on the color patterns. In this paper we implement an algorithm that recognize the different colors based on the HSV system. We are going to interface the algorithm with android application where the android application captures the image and recognizes different colors based on the above implemented algorithm.

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