CAMERA BASED COLOR IDENTIFICATION USING ROBOTIC ARM

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INTRODUCTION:

Industrial automation and robotics are at a high demand in the industry as both of them directly affect the growth of the industry. Quality and flexibility of the product is the important criteria of the industry. Use of industrial robots is leading automation industry to another transition. In 1980”s robots were used for general tasks such as machine tending, material transfer, painting, welding which does not require high accuracy. In 1990 market analysts predicted that industrial robots will become increasingly vital in applications which require high precision and accuracy. Autonomous robots with sophisticated sensors are used in such industries with accurate and précised work output which directly results in the growth of the industry.

In automation Industrial robots are programmed for a single task using the sensory information. A vision system is considered to be the most sophisticated sensor in the present automation industry. The most common technology used at present in the industry is image processing. Due to the advent of powerful cameras, computers, controllers for controlling the machines and sophisticated tools image processing has become the most powerful emerging technology. Image processing is basically improving and enhancing the images taken in daily life using cameras considered as vision sensors for various applications. In the last few decades different techniques have been developed for detecting the objects using vision systems. Color histograms were first proposed by Swain and Ballard as a first approach for object recognition. Other features such as orientation, gradient magnitude were added to the histograms by Schiele and Crowley.

These inventions helped in changing the rotation, direction and deformation but did not help in object recognition. Schneider man and Kanade were first to introduce categorization of objects in natural scenes using wavelet transform coefficients. Wavelet transforms decomposes the image into a group of salient features wavelet transforms by reducing the redundancy of the pixels. When relationship between the parts of the object is considered rather than just the appearance, the most complex methods are used. Part based representation of objects detected in gray images was developed by Agarwal et al. Keeping in view the techniques developed for object recognition MATLAB has the most powerful tool box for image improving, enhancing and categorizing different images using different features such as color, dimensions and texture of the object.
**OBJECTIVE:**

Present day industries are aiming for complete automaton to eliminate the human errors. It had been a major challenge for the Industries to automate the color sorting applications. This project meets the objective by developing an Eye-bot, a typical model used to pick and place the desired color objects from one location to another. The benefits are that it will increase the speed and accuracy of the color sorting process. It will cut down the cost of color sorting process. This project will also optimize the overall productivity of that particular industry.

**METHODOLOGY:**

![Block Diagram]

**CONCLUSION:**

Robotics is a technology with a future, and is a technology for the future. In this project we are introducing a robot which can pick and place objects based on the color. Earlier this was done using color sensors but we have improved the entire project by using a serial jpeg camera which can capture and identify or recognize the color of the image and eventually the robot picks and places that object accordingly. By doing so the speed and the accuracy of the color sorting process is increased. The cost for the color sorting process is considerably reduced. And most importantly there is overall optimization in the productivity if an industry. This robot arm can perform an action which is much similar to human. Although there is significant development in the science of robots, still its usage is
limited due to high cost of production, less availability of resources. If we can overcome these limitations, more benefits can be gained from robotics.

**FUTURE WORK:**

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