

Colour Distinguishing Application using MATLAB

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Abstract—In many situations, autonomous robots can provide effective solutions to tedious task for that a robot can identify objects from the conveyor belt or moving object and relocate them at a proper place with certain criteria. The predicament attempting to answer is to create an autonomous robot that belt based on colour sensing and then sort by relocating them to efficiently and reliably. This can be possible by the use of embedded system.

Keywords: *Pattern-based learning, image retrieval, neural network.*

I. INTRODUCTION

Today we are moving towards a world of automation and smart system. The use of Information Technology and Electronics not only limited to computers and communications, they are also influencing every field. In this day and age of computers, automation is becoming sensing, monitoring and storing the changes per millisecond involved in experiment with accuracy. Moreover, the repetitive tasks with same accuracy and sensitivity can be completed using automated instruments.

Normally, sorting of the objects is done by manually. It consists of 4 integrated stations called distribution, testing, processing and handling. In this case, there is a possibility of minor error which will affect the accuracy in sorting. Also for huge systems, time and manpower required will be very high. Automated systems can be used to remove such human errors and also it saves time and money.

II. PROBLEM IDENTIFICATION

The technological Innovation rapidly replacing human with virtual systems.

Rise of labour cost and difficulty in hiring workers turn enterprises to machines.

There are two reasons why machines are replacing manual labour. On one hand, the development of equipment manufacturing industry and information technology provided hardware support. On the other hand, the more direct reason is that the labour cost rising sharply and the machine have a higher efficiency and lower cost than manual labour. The automated system may provides the solutions

a) Autonomous robot with intelligent conveyor belt system is one of those types of different view for automation in machine

- b) Today in industries, an object is manufactured with little variation like colour, size etc.
- c) For sorting them on colour and size bases we use manual labour.
- d. For all this industries will spend huge amount as wages and take lot of time for processing.

III. METHODOLOGY

A. Sampling of Image

To work with the image one acquires, one must bring it into the MATLAB workspace first. The image of the object is captured using camera mounted on the computer. The input image from the camera cannot process directly. Pre-processing is done on the image such as thresholding. Then only object image I converted in binary format now this binary information has to be analysed so that paper and salt noise can be standing apart. This last threshold image of object is now ready for processing [“Fig.1”]

B. Output Module

The output module consists of the conveyor assembly and dc geared motor assembly. After identifying the colour, command will be sent to direct the dc geared motor. According to the instruction colour dc motor assembly is directed

C. Colour Detection

Colour detection is the ability of an organism or machine to distinguish objects based on the colour and colours cab be measured and quantified in various ways.

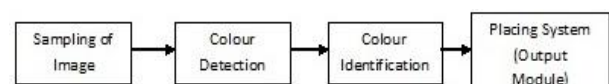


Fig 1: Methodology of Sampling of Image

IV. INTRODUCTION TO MATLAB

MATLAB has many advantages compared to conventional computer languages for solving technical problems. It is an interactive system whose basic data element is an array that does not require dimensioning. It enables a very wide variety of computations.

Image can be assumed as the visualization of what vision senses that is function with variables that represent the spatial coordinate. It holds information about colour as well as shapes. In colour image, RGB colour model mixes those three

prime colour components, red, green and blue, to produce another colour. Image capturing and processing have been used widely in diverse uses such as surveillance and Medical applications.

It has built in Math Function to explore various approaches and get quicker solutions compare with spreadsheet or traditional programming languages, such as C/C++ or Java.

We can use MATLAB for a range of

- Communication system
- Computational biology
- Control system
- Digital signal processing
- Computational finance
- Embedded system
- Technical computing
- Test & measurement
- Image & video processing
- FGPA design & co-design

V. UI CONTROL OBJECTS

- Push Buttons**- Push Button spawns a stroke when pushed
- Static Text** -Static text typically used to label other controls there is no call back routine associated with it.
- Axes**- Axes components enable GUI to display graphics, such as graphs and images.
- Panel**- Panels group GUI components and can make a GUI easier to understand. A panel can contain panels and button groups as well as axes and user interface controls etc.

VI. PROCESS FLOW CHART

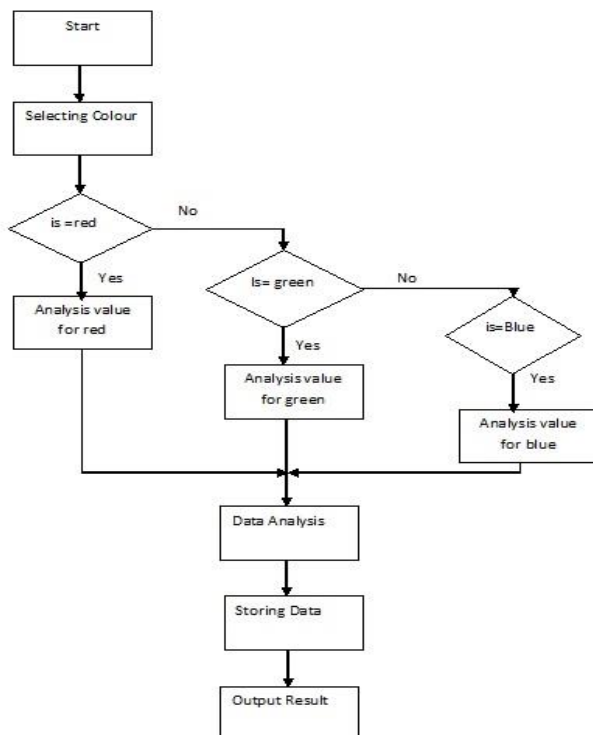


Fig 1: Image Acquisition Flow chart

VII. RESULT

- After execution of program any object can be analysed easily on basis of colour.
- Program employs so that object can be sensed while passing through sensor and its colour will be recognized by sensor and thus object will distinguished and sorted.

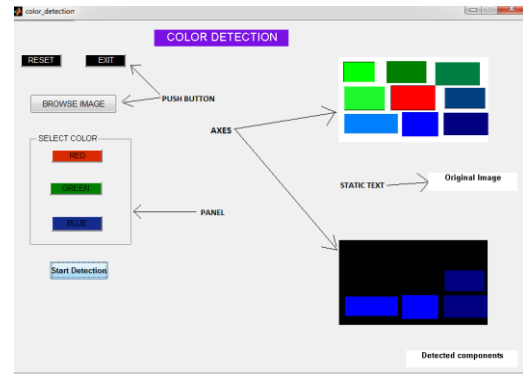


Fig 2: Output Blue colour

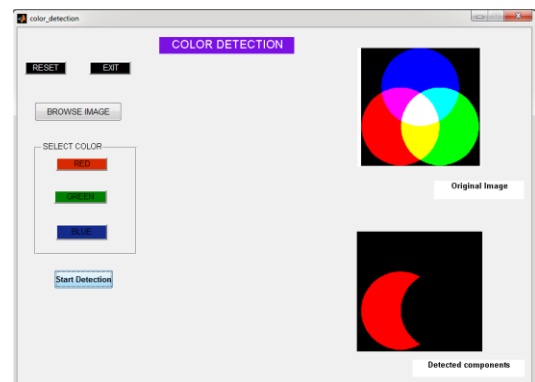


Fig 3: Output Red colour

VIII. APPLICATION

- To sort the products based on the various parameters (Size, Temperature etc) which is tremendous useful for agriculture
- In Medical Scanning machines to sort various tumours

IX. CONCLUSION

- Hence, an object sorting system for domestic/industrial control has developed using the concepts of Image Processing. The model developed is user friendly.
- We conclude that for fast manipulation the algorithm implemented in the MATLAB is suitable for our sorting problem. Result of sorting the object may not work for 100% but it is working for nearly 90 to 94% in case of our algorithm.
- It can be improved by increasing the accuracy and it depends on atmospheric factors. So our goal system has been met to recognize gesture effectively.

REFERENCES

- Bozma HI, Yalcin H. Visual processing and classification of items on a moving conveyor: a selective perception approach. Robot ComputIntegr Manuf 2002;18(2):PP-125-133.
- Automation and Logistics (ICAL), 2012 IEEE International Conference on intelligence conveyor belt;15-17 AUG 2012,PP-337-342.

- [3] M. Veloso , E. Winner , S. Lenser , J. Bruce and T. Balch "Vision-Servoed Localization and Behaviors for an Autonomous Quadraped Legged Robot", Artificial Intelligence Planning Systems, 2000
- [4] L. M. Marvel, J. C. G. Boncelet, and C. T. Retter, "Spread spectrum image steganography", IEEE Trans. Image Processing, vol. 8, pp.1075 -1083 1999
- [5] F. A. P. Petitcolas, R. J. Anderson, and M. G. Kuhn, "Information hiding&mdash,A survey", Proc. IEEE, vol. 87, pp.1062 -1078 1999
- [6] M. T. Orchard and C. A. Bouman, "Color quantization of images", IEEE Trans. Signal Processing, vol. 39, pp.2677 -2690 1991
- [7] S. J. Wan, S. K. M. Wong, and P. Prusinkiewicz, "An algorithm for multidimensional data clustering", ACM Trans. Math. Softw., vol. 14, pp.153 -162 198