

Colour Pattern Generation Technique

Chetan B. Saindane[#], Prof Rakesh Mandliya*

[#] ME (2nd Year) BM College of Technology Indore, MP, India
^{*}Assistant Professor BM College of Technology Indore, MP, India

Abstract— Automation is becoming more important for small scale as well as large scale industries. As automation makes system user friendly and flexible, the effort has to be made in making computer program system user friendly to get connected or interface property for automation. Proposed work is new invention in automation system. Proposed system will generate various colour images automatically on single television screen. This system uses AVR microcontroller and feedback to control adding of concentrates.

Keywords — AVR Microcontroller

I. INTRODUCTION

Automation plays an important role in today's industry world as work becomes easier and system becomes user friendly. Proposed work is part of automation system. This system will generate various colour images automatically on single television screen.

CNC (Computer Numerical Control) machines are available for various colour generation but they are not affordable for small scale industries. Also CNC has large footprint so they cannot be installed in small scale industries. CNC has lot of manual work so they are not very user friendly. CNC makes proper combination of red, green and blue colours to get multiple shades of particular colour. CNC is far noisier and has more mechanical movements even though it is computer controlled.

Considering all the drawbacks of CNC system proposed system is designed. The system is based on various colour generations on single television screen. Using proportionate percentage of basic primary colours red, green and blue concentrate can make any colour and any shades.

Basics of colour and light:-

Light is a narrow range of electromagnetic energy, to which the human eye is sensitive. Generally light is described by its wavelength; it ranges from approximately 380nm to 780nm.

Materials can modify the light incident upon them in several ways. Light can be reflected from a surface. Light can be absorbed by, or transmitted through, a surface. In many cases, light is both absorbed by and reflected from a surface. The amount of absorption and reflection is often dependent on the wavelength, resulting in some wavelengths being absorbed and others reflected, to varying degrees.

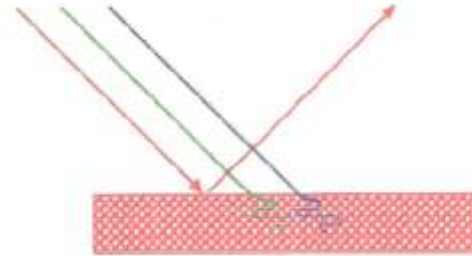


Fig 1- Reflected light from an object, perceived by the human eye, is what gives an object its colour

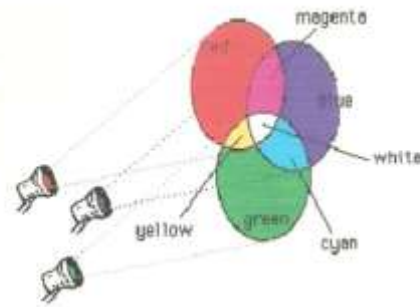


Fig 2-Production of Colour by Combining RGB

II. SYSTEM IMPLEMENTATION

1) COLOUR GENERATOR –

The colour generator has three inlets each for red, green and blue. These three inlets are attached to the mixing container. For red, green and blue colour the container has three different light sources. The container has motor driven conventional power supply. The LDR will read the reflected intensity and will convey the processor, using ADC. Then processor will calculate which concentrates requirements to be added to the container so as to bring the current LDR reading to the desired value. If the mixture in container does not require any more red concentrates same for blue and green, it will control the particular valve at the inlet specified above since being a control system the feedback from LDR helps the system to attain the desired colour. If processor finds that the LDR reading matches one with that given by the computer it will stop all three valves and also sound the buzzer to indicate the supervising person that the desired colour has been obtained and now he can stop container motor.

2) ARDUINO KIT BOARD

Arduino simplifies the amount of hardware and software development you need to do in order to get a system running. The Arduino hardware platform already has the power and reset circuitry setup as well as circuitry to program and communicate with the microcontroller over USB. In addition, the I/O pins of the microcontroller are typically already fed out to sockets/headers for easy access (This may vary a bit with the specific model). On the software side, Arduino provides a number of libraries to make programming the microcontroller easier. The simplest of these are functions to control and read the I/O pins rather than having to fiddle with the bus/bit masks normally used to interface with the Atmega I/O (This is a fairly minor inconvenience). More useful are things such as being able to set I/O pins to PWM at a certain duty cycle using a single command or doing Serial communication.



Fig 3 Arduino Kit board

3) AVR Microcontroller

AVR is a microcontroller originated in 1996. This is modified Harvard architecture 8 bit RISC single chip microcontroller. AVR uses on chip flash memory for program storage.

4) LCD Module

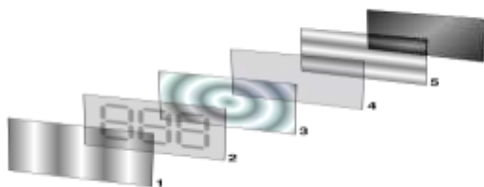


Fig 4 Constructional diagram of LCD module

1. Vertical filter film to polarize the light as it enters.
2. Glass substrate with ITO electrodes. The shapes of these electrodes will determine the dark shapes that will appear when the

LCD is turned on or off. Vertical ridges etched on the surface are smooth.

3. Twisted pneumatic liquid crystals.
4. Glass substrate with common electrode film (ITO) with horizontal ridges to line up with the horizontal filter.
5. Horizontal filter film to block/allow through light.
6. Reflective surface to send light back to viewer. (In a backlit LCD, this layer is replaced with a light source.)

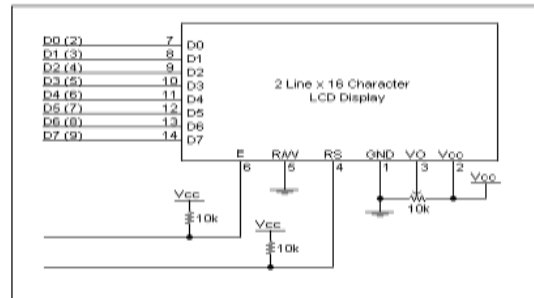


Fig 5 Pin Connection of LCD

III. ALGORITHM OF SYSTEM

This algorithm shows overall working of proposed system.

1. Start.
2. Initialize all Input –Output Ports.
3. Turn OFF all relays.
4. Turn OFF all LED's.
5. Initialize LCD.
6. Turn ON Green LED.
7. Get reading from LDR.
8. Turn ON Red LED.
9. Get reading from LDR.
10. Turn ON Blue LED.
11. Get reading from LDR.
12. Display the readings on LCD.
13. Compare the readings with the set value.
14. Accordingly turn ON/OFF the three valves.
15. Go to 6
16. Stop

IV. ADVANTAGES

1. Fully automatic system
2. User friendly
3. High flexibility
4. High accuracy
5. Time saving
6. Simple in operation
7. Portable

V. EXPERIMENTAL RESULT

Using microcontroller based colour combination of RGB framework using colour local texture features the Experiments of colour mixture is done.

The following are the different outcomes regarding testing and implementation of colour mixture module.



Fig 6 Color texture Sensor



Fig 7 Colour Mixture Assembly

Finally we have got desire result which is accurate colour pattern and accurate colour percentage with different testing.

VI. CONCLUSIONS

This system is designed to produce colours on television screen automatically. This system reduces human efforts and gives correct and better results. This system is beneficial for small scale as well as large scale industries.

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