

Color Based Detection of Cyanosis

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Abstract - Color based detection of cyanosis can help to reduce the trouble of travelling to both doctor and patients. In this project specialized matlab program is used to monitor patient's medical condition. This project can be used to remotely diagnose a patient's medical condition of cyanosis. This project is based on the concept that in some medical condition certain body parts undergo changes in color. With the use of matlab software images are processed to detect medical conditions which are color based.

Key Words: Color detection, Cyanosis, Matlab, Hypoxemia, Discoloration

1. INTRODUCTION

Cyanosis is a medical condition in which there is discoloration of skin at certain body parts. So, the color of skin changes to blue as the quantity of deoxygenated blood increases. Cyanosis develops in many other conditions such in cells also as heart failure, hypotension, obstruction of blood vessels, hypovolemic shock, thrombosis in deeper veins and hypothermia.

Blood which is oxygen rich is intense red in color. When the oxygen in blood has a lower level and becomes a dark red in color, extra blue light gets reflected, made the skin to appear bluish in color. Being cold is the major cause of bluish hands and feet. Your extremities being warm can also be a reason for blue hands and feet. Peripheral cyanosis shows signal that there is an problem with body's system of providing oxygen-rich blood to the tissues of your hands and feet. It can also be the result of low level of oxygen in the RBCs. Carrying oxygen through body i.e., traveling from lungs to heart is the responsibility of blood then it is pumped through your arteries to the rest of the body. After blood has been supplied to body tissues, the blood which is oxygen-depleted returns back to the heart and lungs through veins. If something prevents blood from returning back to the heart through veins, or halts blood from reaching the tissues in the first place, your tissues would not get the oxygen-rich blood which is needed to them.

The main purpose of using the matlab software in our project is its efficiency. Its UI is user friendly. It is easy to implement and test your algorithms. The results

obtained from matlab software is more accurate. Matlab can process videos and it can also process still images. In cyanosis skin color changes to blue. This program is made in such a way to detect that particular change occurring on the surface of skin. This change in color is more visible when compared with normal skin surface. Cyanosis may not occur all over the body but on certain body parts. As opposed to the common belief, cyanosis is not a disease. It is a medical condition which can refer to a particular disease. Cyanosis is a curable disease.

2. LITERATURE SURVEY

Cyanosis is diagnosed based on a medical history of patient and also through physical examination. Ancillary studies can also be used for diagnosis purpose. Since in most instances, the cardiopulmonary system is involved in most of the instances to focused assessment of both systems. If a congenital heart condition is suspected, transthoracic and transesophageal echocardiography can be used to evaluate the cardiovascular system. The important diagnostic tool is to assess blood flow and shunting. Pulmonary causes of cyanosis like pneumonia, pulmonary embolism and pleural effusion can be assessed with imaging studies like radiographs, computed tomography scans, and ultrasounds of the chest. If hypoxemia is examined as a cause of cyanosis, the primary evaluation should comprise of pulse oximetry and arterial blood gas.

Cyanosis is known as the discoloration of skin and mucus membrane, causing it to turn blue due to lack of oxygen in blood.

Cause for cyanosis : Lack of hemoglobin in the blood cause Cyanosis. The amount of decreased hemoglobin should be at least 5 to 7 g/dL in the blood to cause cyanosis.

When distribution of cyanosis happens, it can be seen on entire body. The visibility is more in particular area where the skin is thin. These body regions are lips, cheeks, earlobes, nose and fingertips above the base of the nail.

1. Any situation that can cause arterial hypoxia and stagnant hypoxia. Cyanosis cannot take place in anemic hypoxia due to the hemoglobin level being low. This does not happen in histotoxic hypoxia because of tissue damage.

2. The conditions when it is changed, it forms hemoglobin. Because of factors like poisoning, the hemoglobin changes to methemoglobin or sulfhemoglobin leading cyanosis. The discoloration of cyanosis is because of these compounds having dark color only and not because of low hemoglobin content.

3. PROPOSED SYSTEM

3.1 Objective of the Work

- To introduce the concept of color detection to detect cyanosis.
- Development of low-cost medical solution to detect cyanosis.
- To make this project cost effective and pocket friendly.

3.2 Proposed System Approach

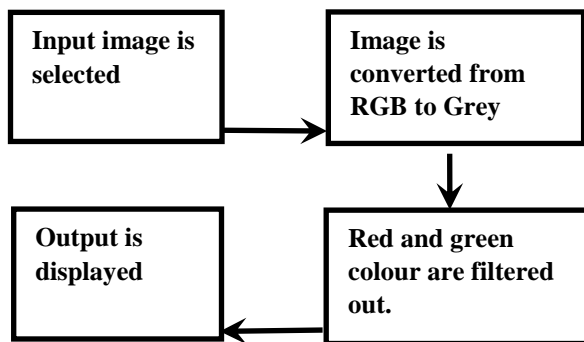


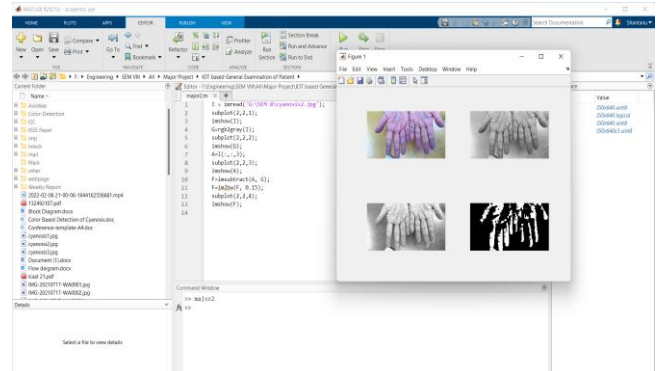
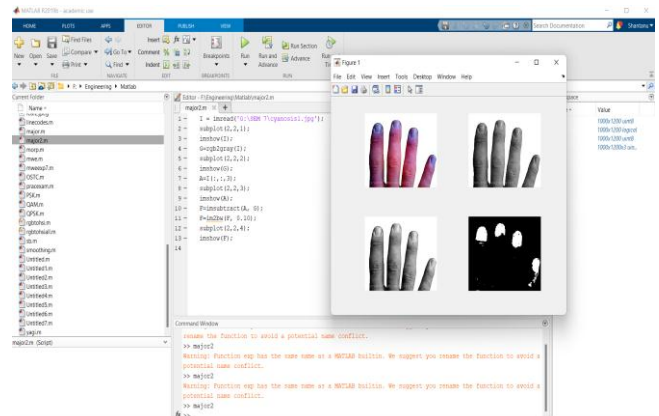
Fig -3.2.1: Work-flow of the proposed system

In proposed system, an image of a body parts is given as input in which certain portion of body parts are in blue color. After that the input image is converted from RGB to Grey. Since blue color is to be detected so red and green color is filtered out. Using colon instead of R and G will filter these color and the system will detect the blue color. Hence the bluish color of the skin is detected.

4. SOFTWARE REQUIREMENT

Matlab - MATLAB is a commercially available software that can be used for testing and simulation of various algorithms and programs. Matlab is a programming language which is specially designed for Engineers & Scientists. In Matlab, MAT stands for matrix and LAB stands for laboratory. It works on mathematical equation. Simulink is also the part of matlab which is based on graphical programming environment for the purpose of modeling, simulating and analyzing multi domain dynamical system.

5. RESULTS



6. CONCLUSIONS

In this project we have built a technique which is used to detect a medical condition called cyanosis. This will increase the efficiency to detect the condition. It will save time for both doctors and patient.

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