

LASER SKIN TREATMENT ROBOTIC ARM

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ABSTRACT

The common use of term Heliotherapy is associated with treatment of skin disorder which is used by Dermatologist. Heliotherapy is used to cure skin disorder including acne, dark spot, white spots, eyes dark circles, pimples and many more. Normally dermatologist provides treatment on the entire face as it was not possible to diagnose the specific portion of the patient's face. Dermatologist also has to diagnose the patient's face manually and also has to wait till the completion of treatment. Heliotherapy robot is designed in such a way that it can treat a particular portion of the human face. Once the robot is taught the specific positions of treatment it starts the treatment automatically and there is no need of dermatologist to stay there till the end of treatment. Robot will do its work efficiently and accurately Accuracy and Efficiency are two complementary sensing capabilities that can be exploited in a synergic way to enhance the autonomy of a robot manipulator during the interaction with the environment. In fact, a robot may achieve global information on environment using accurate input.

In recent years, several approaches where Accuracy and Efficiency measurements are combined in the same feedback control loop have been proposed, as 3D pose estimation for robotic applications based on a multi-camera hybrid visual system [5], Position control of robot manipulation in robotics and automation [2], [3]. These algorithms improve position control schemes. e.g., speed control, voltage measurements, position control.

Keywords: *Heliotherapy, 3Dpose estimation , robot manipulation.*

I. INTRODUCTION

Laser treatment is a one of the most important for the skin facial or any skin disorders. In abroad, many people are facing many skin problems due to intensity of Sunlight. Intensity of Sunlight is very less in foreign countries compared with our country.

The common use of the term laser treatment (*Heliotherapy*) is used to cure skin disorders including dark spots, white spots, eyes dark circles, pimples and many more. Normally dermatologist has to diagnose the patient's face manually and also has to wait till the completion of treatment.

The term Helio is light and our project is a light therapy Robot so we named it as Light treatment robot. It is associated with the treatment of skin disorder which is used by dermatologist. Heliotherapy is used to cure skin disorders including acne, dark spots, white spots, eyes dark circles, pimples and many more. Normally dermatologist provides treatment on the entire face as it was not possible to diagnose the specific portion of the patient's face. Dermatologist also has to diagnose the patient's face manually and also has to wait till the completion of treatment. Heliotherapy robot is designed in such a way that it can treat a particular portion of the

human face .Once the robot is taught the specific positions of treatment, then it treats automatically and there is no need of dermatologist to stay there till the end of treatment. Robot will do its work efficiently and accurately. Today dermatologists are using Heliotherapy which is gaining enormous popularity worldwide because of its results. But these results are based on quality of treatment given by well trained and qualified dermatologist who may cause your time as well as money. Therefore introduction of such a robot which can provide same line of treatment is needed. The cost of laser treatment is minimal, which can improve skin health, brightness and younger and smoother skin with healthier looking. During this laser are used to dissolve molecular bond. Now days the doctors are used the laser guns for this skin treatment. While there are some topical, famous creams are in the market nothing can rejuvenate your skin laser treatment, and the technologies are changing constantly. Today dermatologists are using Laser treatments which are gaining enormous popularity worldwide because of its results. But these results are based on quality of treatment given by well trained and qualified dermatologist who may cause your time as well as money.

II. DESIGN CONSIDERATION

In this proposed work we are trying to develop a robot that can help a dermatologist to treat his patient with a laser therapy called as Heliotherapy. Only the doctor has to just feed the patient's primary information and examine his skin and decide the mode of the treatment if it is heliotherapy that he/she can use this robot.

First he/she has to teach the arm of robot to save the locations where the treatment is expected on pc and controller and as the tip of the arm is provided with a colour selection button he/she can select the color of LEDs and save it. Then he has to give the time interval of each treatment at each location. Once he saves it he can start the treatment and you can watch the arm is moving from rest position to the desired position and giving treatment at those points.

If the same patient visits next time doctor doesn't has to repeat the above task he can only recall the patients profile which will be saved at database connected at pc and start the treatment again. If suppose there are changes in the line of treatment for example if suppose color of LED is to be changed at certain location then he should only change the color at the pc software and save it. The color will be changed. As shown in Figure 1 Locations come from doctor, will be saved through the keyboard. After that we will decide simultaneously the color that should be given to respective locations.

We can save the data of that particular patient by using VB so that from first day only, all the records of treatment can of weekly or monthly duration. Future, data of location and color will be given to c arm by using keyboard. After that we have to just adjust arm to first location^[2]

After that, arm will work to respective location accordingly, with over, it will stop automatically and the work which is done until now will be saving in VB.

III. PROPOSED SYSTEM ARCHITECTURE

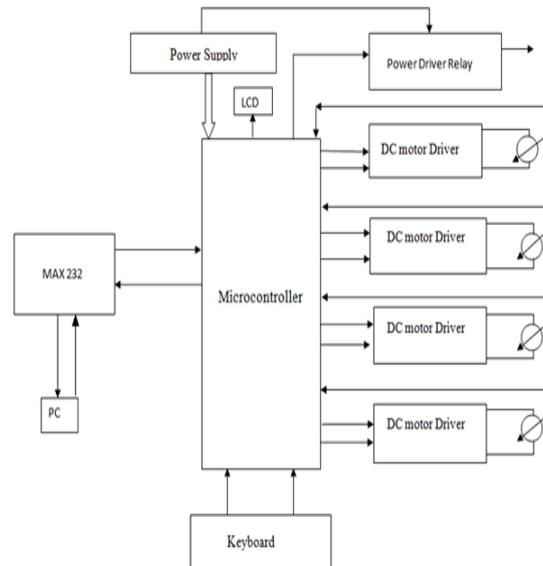


Fig 1

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This system consists of mainly four units that help the arm to reach at the specific location and diagnose the damaged skin of the face. The four units are as follows:

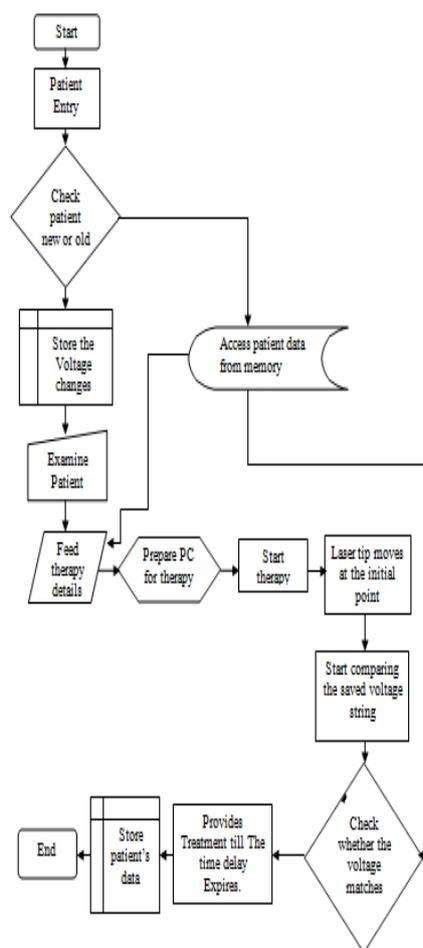
- **Control unit:** Control unit consists of microcontroller that may be ARM or DSP depending on number of ADC ports for future expansions. The control unit stores the location point on the face. It detects the change in voltage at potentiometer which is at driver unit. Once the process is asked to run by clicking on start button the control unit recalls the saved location and controls the arm to reach at right locations.
- **Driver unit:** Driver unit consists of four DC motor drivers which are controlled by control unit. DC motors are located in such a way that the arm can move in each and every direction possible. This assembly consists of a potentiometer that tracks the change the direction and sends it as a feedback to control unit.
- **Interfacing unit:** Interfacing consists of IC MAX 232 and DB9 connector which is used as a communication unit between PC and control unit.
- **Power supply unit:** Power supply unit consist two mode power supply with has 5V supply to controller and 12V to power driver relay.

IV. SOFTWARE DEVELOPMENT

Some Basic steps:

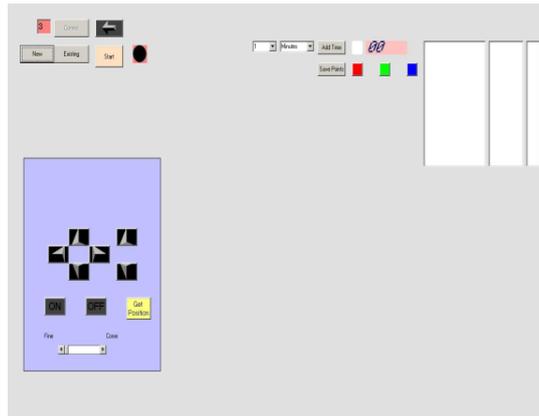
1. START
2. Patient enters in clinic
3. Check whether is new or old.
4. If patient is new than store his\her information in data base.
5. As per the location given by doctor, feed those locations of treatment.
6. Enter time variant with given specification.
7. Prepare robot for therapy using PC.
8. Start therapy.
9. After completion of process it stops.
10. End

Flow chart

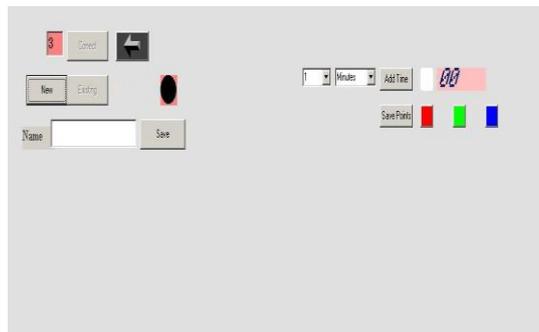


V. RESULTS AND OBSERVATIONS

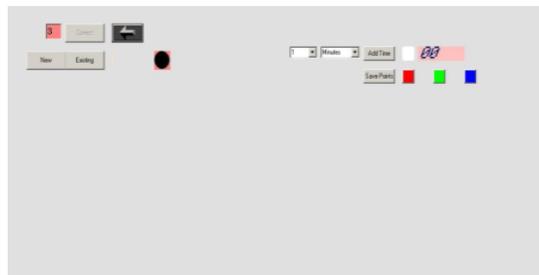
1. **Getpoint**



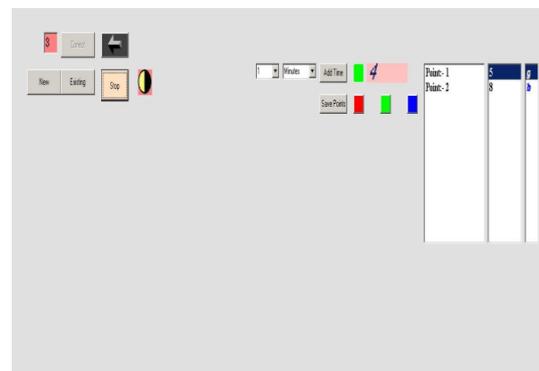
2. New Entry



3. Online Data



4. Running



5. Database

The introduction of microcontroller IC16F676 at each motor driver helps us to interface many other treatments to our main microcontroller IC18F4550 which may help us to manage whole clinic.

2. We can use camera at the tip of the laser so the doctor can keep a check on various treatments.

The introduction of camera at the tip of the robotic arm can help doctor to keep a continuous watch on current treatment and also helps to make our device fully automatic.

REFERANCE

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