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Design and Analysis of Malnutrition Identification and Implementation by using Recent Technologies

N Vikraman and J Mohana

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N.VIKRAMAN, M.E

Research Scholar, Department of Electronics and Communication Engineering,

Saveetha School of Engineering, SIMATS, Thandalam, Chennai – 602105

E-mail: vikramann@rocketmail.com, studychennaiv4u@gmail.com

Dr.J.Mohana, Associate Professor, Saveetha School of Engineering, SIMATS, Chennai - 602105

Abstract :

Nowadays globalization and modernization life style changing the people life style and dietery. Computers, televisions and mobile phones are also reduce the physical level activity of the human day life. It reduces the people health condition and economical level of our country. It also improves the poverty level in our country. Our country major issue is nutrition problem. World Bank Estimates India is the 2nd country in the world by affected the malnutrition. It affects Preschool Children, Adolescent Girls, Pregnant Women, Socially deprived people etc. Our government also conducts lot of nutrition development program for public health awareness. But it will not reach the correct way to the people. Also the government could not get the accuracy value of malnutrition affected people. Here, non-invasive method for identifying the malnutrished person without breaking or puncturing the skin. Today finger print biometric is very important & very easy way to identify the true information from the appropriate people. Our government also emphasize the people to get AADHAAR card for getting the government plans beneficiary. So finger print is used to register the people's information. Here, the thumb impression is used to register the AADHAAR number and identify the people to detect the nutrition problem. The wireless technology is used to send the messages to the malnutrishion affected person through mobile.

Keywords: Blood types, Optical Sensors, Camera, Photo-detectors, Image Processing, Pattern matching, Filters, Malnutrition.

Scope:

To know the people health condition to the government / Admin of the organization. Government/Admin can create awareness about diseases and their symptoms through the mobile application. To improve public health care. Here various technologies are used to identify the malnutrishion affected people. It is also used to monitor the nutritional programmes and also used to calculate their effectiveness. Besides, the Identification of appropriate response of malnutrished strategies. This can be included the food and non-food assistance to address the particular causes of malnutrition.

Problem identification:

The Present method has complcated, expensive and long time. Upto now most of the villages not getting proper medicine. People Health has become an important consideration as country performance and developments. Our design method is various strategies methodologies and health management for every organizations and school children. Image Processing Technologies is used to identify the various disease at smartest way. Future challenges that met to design easy way to get medical report of village people's health condition to government. Detect rbc & wbc blood cell images:

Methodology:

In input Bio Informatics technology is used to collecting the people information. Bio sensor is used for input devices. Digital Image processing technology is used to process the input images. Wireless Networks technology is used for output unit.

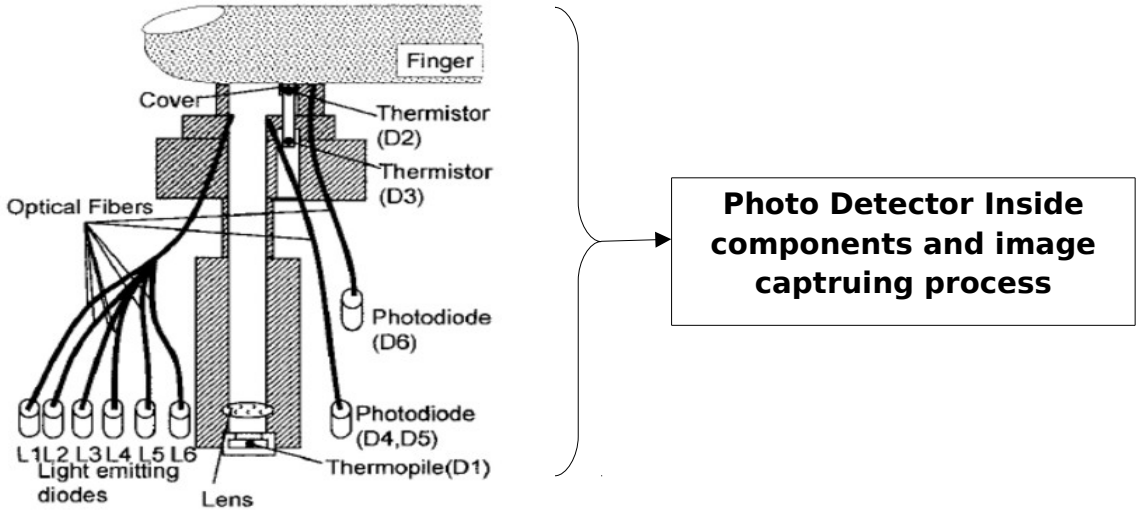
In Input Unit Non invasive method is used to getting the proper people information for processing the data. Here Bio Optic technology helps to detect the WBC and RBC cells in the blood. Photo detector act as a biosensor device.

Our blood image usually shows four types of components 1.plasma - is a fluid made up of proteins and salts, 2. Red blood cells or erythrocytes, 3. White blood cells or leukocytes, 4. Platelets - help your blood to clot. The most represented cells in the blood are red blood cells and white blood cells. Leukocytes are easily identifiable, as their nucleus appears darker than the background.

Non Invasive method to capture the blood images:

Biosensor device is used to capture the biological signal of our human body and convert it into electrical signal. It involves the combination of biological entities like proteins & enzymes, RNA, DNA. Here electrochemical transducers are used to detect and observe the certain biological entities like antibody-antigen interaction. The non invasive device includes LED, Photo Diode, Thermister, Optical Fibers. Its main advantages are no pain, no need to take blood out, accuracy reading & easy for processing next level identification.

Figure 1
Thumb impression on bio Optic devices.
Components involved;
Thermopile (D1), Photodiode (D6), Light Emitting Diode, Thermistors (D2 & D3)
Photodiodes (D4 & D5).
Optical Lens (For focusing the image)
Optical Fibers (To connect the inner components)



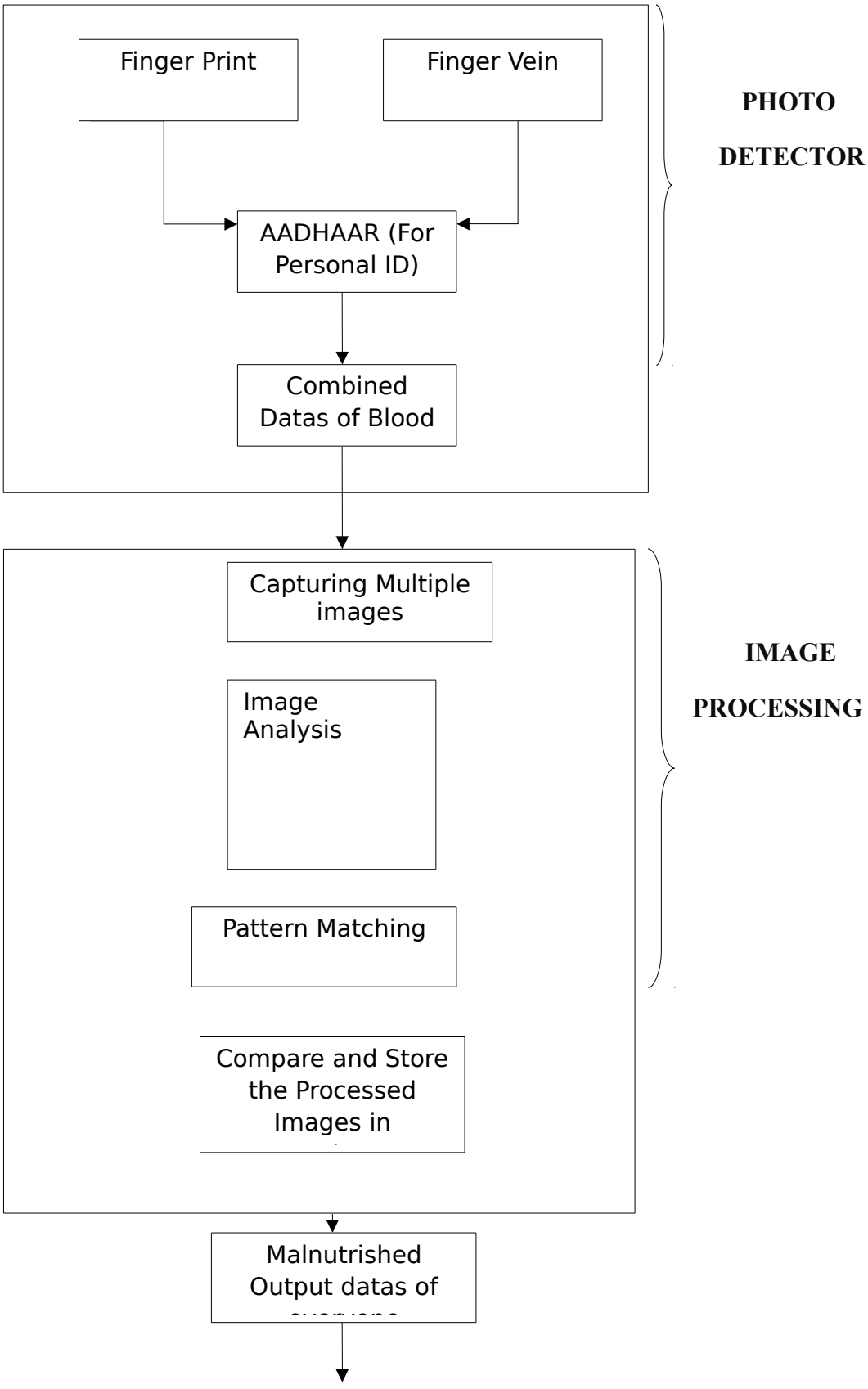


Figure.2 Image capturing and image processing methodology.

Finger Vein: A finger vein is totally different of its unique even of between twins person also. It has expanded more eagerness for approval. Since it lies under the skin, besides it will not change the midst person's lifetime. It is hard to copy. The essential good position of finger vein is exist only for live people. In the finger vein confirmation structure, the vascular precedents of an individual's finger is very close and personal distinctive confirm data. It has more tangled vascular model and more broad data likewise it contains a wealth of isolating features for individual Identification. The finger is an ideal bit of the body for this development. It does not have hair which can be an restriction for capturing the vein precedent. It is very less affected to a modification in skin shading, as opposed to a back of a hand or finger.

Technique:

Steps:

1) The optical device is placed on the people's fingertip in a similar way as to count the RBC & WBC levels of the skin surface.

2) The sensitive photo-detector is used to traces the path of light on being deflected or absorbed by the red blood cells.

3) Here the light is absorbed by the hemoglobin in the red cells, and at the same time light gets scattered by small margin on hitting the edges of the antigenic. It helps the determinants having specific structure/shape.

4) The light scattering is captured by keeping the optical device ON for specified time to capture the scattering – Multiple images are taken by the device.

5) Here image processing algorithms recognize these scattering events and record the pattern of the scattered light – which depends on the molecular shapes of epitopes. The Optical light is highly sensitive to size, shape, and composition of RBC occurring due to the presence of epitopes of various antigens.

6) The recorded pattern gives an estimate of the concentration (or type) of antigens (or antigen-antibody or antigenic substance) in the blood cells. It provides the blood type – e.g. Blood type B has antigen B on its RBC surface.

7)Then these images can be processed and identify the malnutrition for the affected people.

8)These images can match to the finger print for the AADHAAR Card.

9) Wireless technology is used to send the messages to the affected people.

Image Processing Methods:

After collecting these blood images or samples from organization or companies or school/colleges person, these images undergoes to the image processing techniques.

This image processing techniques can be done by MATLAB software. Basically, this method used to count the Hemoglobin, Plateless, RBC and WBC number and match the standard values. Also these values & images gives the final output of malnutrished person's details. Here the image acquisition method can be done by bio-optic devices such as Thermistor, LED devices.

Healthy person blood count:

Type of Gender Blood Cell	Gender	
	Women	Men
Hemoglobin	12-15 gm/100 ml	14-17 gm/ 100 ml
Platelet	150-450 thousand/Microlitre	150-450 thousand/Microlitre
RBC	4-5 million/Microlitre	4.5-6 million/Microlitre
WBC	4.5-11,000 per microlitre	4.5-11,000 per microlitre
Hematocrit	36 – 45%	42-50%

Table.1 Average Blood Cell count Values.

Advantages:

Time Consuming, Eliminating Pain, Useful for Emergency situation, Easily determination and identification of safe blood, Admin/Government can monitor the progress of patients 'health now and then to advise them about their health, Government/Admin can create the awareness about the diseases and symptoms through communication media(Mobile/e-mail), Identify the nutrition affected area in our country & future drugs needed, Processing is more

accurate than manual, Fast Identification, Awareness programs can easily reach the corresponding people.

Future Work:

This method could be extended to any commercial optical equipment like camera, etc. with minor changes to the device. The technique can be extrapolated to Smartphone cameras for obtaining results at low cost and within a short-time. The "portability" feature could add a commercial value to the innovative solution.

Discussion:

Improving nutrition is **good development of our country's economical level.** If a child or human being **malnourished** in the womb or before the age of two the damage can be **irreparable. Changing is possible in the world**. Well-nourished childrens are less prone to diseases and illness of their health and are more able to concentrate at school. Tackling child malnutrition is the **right thing to do**. Children shouldn't be going to bed hungry every night. In further, we identify the link between disease, level of malnutrition and education of every people. All the Non-Governmental Organizations (NGOs) and government health agency groups can play an very important role to develope the living conditions in the slums, by providing protection to workers, treating all the diseases, and making the quality of education accessible.

Conclusion:

Researchers can work upon the detection of various disorders (Luukemia, anemia and likewise) related to upnormal blood cell count.

It is emerging and significant element of next generation health care services. It's a software based solutions for counting the blood cells. Image processing based method of cell counting is fast, cost effective and produces accurate results. MATLAB software is used for the analysis. The accuracy of a system depends upon the quality of input image, Camera used for

acquiring an image. Everyone can get the health condition datas in E-mail/SMS and other communication devices.

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Author Profile:

N. Vikraman, M.E, Research Scholar, Saveetha School of Engineering, Thandalam, Chennai, Tamilnadu, India.