

Analyzing and Processing of Wound Detection

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Abstract— A Java framework for detecting and processing wound images, which are used by various users, like Doctors, Patients and other medical store users. We implement in Java traditional methods and algorithms for detecting a digital picture of a wound from a specific distance, for identifying its boundaries and for detecting it's exact area. We build in Java models for various categories of wounds, due to etiologies' such as pressure, burn, chilblain, vascular insufficiencies, diabetic foot ulcer, venous leg ulcer and other chronic disease states. Based on color and texture analysis, we identify the main barriers to wound healing, such as tissue non-viable, infection, inflammation, moisture imbalance, or edge non-advancing.

The Java framework provides the infrastructure for providing prescriptions related to the specific wounds which can be used by different users. Also, we rely on new paradigms of artificial intelligence (Bayesian Inference, Case Based Reasoning and Intelligent Agents) for detecting wounds and creating prescriptions. We will also use some algorithms for finding the exact area of wounds in images. For that we can use canny edge detection, detection of similar pixels and making group of them. To implement these algorithms, we use Java technologies for dynamic processes and MYSQL technologies for dynamic content (data storage and documents). Also after getting the exact wound we will provide the prescriptions to user or patients for that particular wound by comparing two wound images using pixel comparison algorithm. We have to show the different wounds detection in different captured images.

I. INTRODUCTION

Medical images are valuable in both didactic and research activities, for students in medicine and pharmacy. Digital pictures are in great demand, because digital technologies provide unlimited resources for medical and pharmaceutical education. Computerized image processing contains methods for non-invasive wound evaluation, allowing an accurate diagnosis in a large category of patients with damaged and ulcer skin. Traditional non-invasive technologies are limited frequently to subjective visual evaluations. We are developing a standalone application for wound detection system using Java Swing. It is useful for patients and doctors. In this application we have to find wound image in given image or captured image through camera. Then after finding wound in that

image we will compare it with previously stored wound images and will give the precautions which are stored in database. If the wound is not available in previous wounds then, the new wound image and its precautions will be stored in database

The need of projects is to help for detecting and processing wound images, which can be used by various users, like Doctors, Patients and other medical store users. This paper represents our initial work towards a model of color and texture based simulation for wound healing. We use the RGB (Red-Green-Blue) color space to define a set of image features for every category of wounds. To identify a wound in an image, we implemented specific methods based on some generic criteria, such as normal skin, wound skin, yellow wound, black wound, red wound, etc. Also we can use different algorithms for detecting exact area of wounds in images. For some applications we use as main colors Red, Yellow and Black to assess the gravity of a wound. Generally, wounds have a non-uniform mixture of yellow slough, red granulation tissue and black necrotic tissue. Analyzing a succession in time of more images for the same wound, we can assess the recovery or worse evolution.

II. LITERATURE SURVEY

Digital pictures are in great demand, because digital technologies provide unlimited resources for medical and pharmaceutical education. Computerized image processing contains methods for non-invasive wound evaluation, allowing an accurate diagnosis in a large category of patients with damaged and ulcer skin. Traditional non-invasive technologies are limited frequently to subjective visual evaluations. Color and texture information provide the infrastructure for a structured approach to non-invasive wound assessment. As presented in (Hansen et al. 1997), statistical methods are useful in assessment of potential methodologies for non-invasive wound evaluation using a color imaging system. In (Krouskop et al. 2002) is described a noncontact wound measurement system for surface area and volume of wounds. A classification method based on color and texture analysis is proposed in (Acha and Serrano 2000), being applied for burn wound images.

There also many blob detection, canny edge detection algorithms used for detecting various structures such as human face. We know face recognition is in demand nowadays. Some organizations have worked on developing algorithms for detecting faces. Also some have developed the algorithms for calculating size of wound

area but they didn't succeed. We will use specific algorithms for detecting wounds in images.

III. PROPOSED SYSTEM

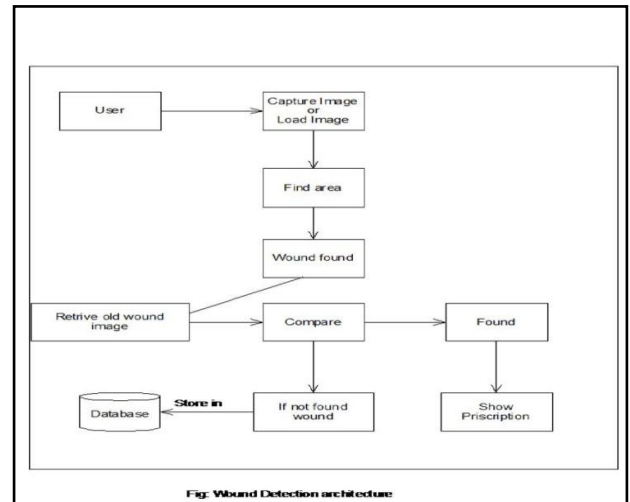
Our purpose is to develop application for various users, like Doctors, Patients and other medical store users, to be used in both didactic and research activities or for providing precautions to patients with wounds. In (Prodan et al. 2003) we defined and implemented a Java framework for designing and implementing detection scenario. We used this framework to develop application for various users, like Doctors, Patients and other medical store users, to be used for providing precautions to patients with wounds. We have to detection scenarios by applying this method to large amounts of wound image data stored in XML based knowledge data.

The purpose is to develop appropriate skills in wound management for a learner that traverses such an detection scenario. Wound image understanding is a difficult knowledge-based process and we have to use the new paradigms of Artificial Intelligence (e.g. Bayesian Inference, Case Based Reasoning and Intelligent Agents) to manage it. We will also use some algorithms for finding the exact area of wounds in images. For that we can use canny edge detection, detection of similar pixels and making group of them. To implement these algorithms, we use Java technologies for dynamic processes and XML technologies for dynamic content (data storage and documents). Also after getting the exact wound we will provide the prescriptions to user or patients for that particular wound by comparing two wound images using pixel comparison algorithm. We have to show the different wounds detection in different captured images. We collected large amounts of wound image data and we have to include them in XML and CBR (Case Based Reasoning) knowledge bases. We are working in a continuous collaboration with physicians and wound care experts from our university and from health care and medical units.

IV. SYSTEM ARCHITECTURE

User will log in to enter application If user is not registered then he will get registered and fill the required details. After entering the application user can manage all the information about patients i.e. Patient data (name, address, gender, weight, other health records, mobile number etc. Then user will capture the live image or will load the stored image and it will be stored in system. Now from that captured image we will detect the exact wound area using algorithm explained as.. In detection of similar pixels, pixels with similar color are stored in array or something else then from that array one center point will be taken and area around that center will be marked. After that the detected wound will be compared with other stored wounds and the comparison will be done on the basis of pixel by pixel matching. Then the prescriptions will be shown to user. If the wound is not found then that wound will be stored and prescriptions about that wound will be stored in XML files, as we are using XML as

database. We have to show in GUI the detected wound and stored matched wound on one frame. So user will understand.



V. ALGORITHMS USED

- 1) Reads the digital image in main memory.- It's meaning is the system reads the image pixel by pixel and stores it in array.
- 2) Convert pixel data of the digital image into a three dimensional array that is better suited for processing.- Then converts that array in three dimensional array.
- 3) Make a working copy of the three-dimensional array, in order to avoid having to make changes to the original array of pixel data. The working copy is sacrificed in the process of analyzing the image, while the original image rest unchanged.
- 4) Display on the same frame both the original image and the modified image that contains the output results.
- 5) We take copies of wounds and then store them n database with their respective precautions, descriptions etc. After taking new image of wound we compare that new image with all the images in database. And if match found then we show precautions. The comparison of images is based on pixel by pixel comparison which returns % of matched pixels. On that we can decide that image is perfect match or not.

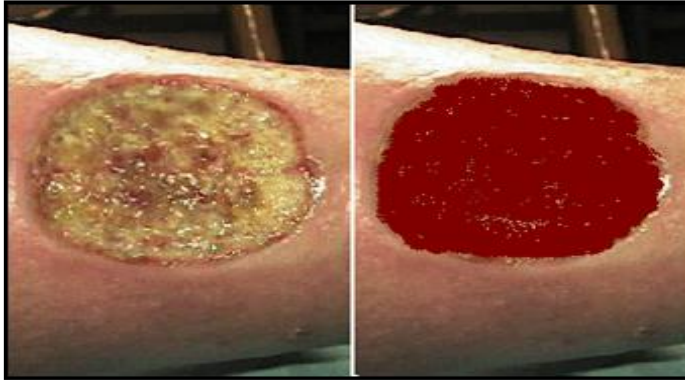
VI. TECHNOLOGY USED

- JMF Framework
For capturing the image through web camera we are using JMF framework and will store that image at specific location.
- Similar color pixel detection
For detecting the wound we are using similar pixels detection algorithm. In this algorithm the similar color pixels will be found and stored in array. Then by taking average of locations we will get center of that group of pixels. Then we have take the area around that center pixel and we will get the wound.
- Pixel by Pixel Comparison

For comparing two images or wounds we have to use pixel by pixel comparison

- MY SQL

For storing information about login user and patients and prescriptions we have to use MYSQL database.



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