

# Chronic Wound Healing and Recommendation Management System Based on Mobile Applications

Saravanan Lalbagathur<sup>1</sup>; Dr. Shobana Devi A.<sup>2</sup>

<sup>1</sup>Student of Master in Technology, <sup>2</sup>Associate Professor

<sup>1</sup>Department of Computational Intelligence, SRM Institute of Science and Technology

<sup>2</sup>Department of Data Science and Business Systems, SRM Institute of Science and Technology

Publication Date: 2026/05/19

**Abstract:** The Main scope of the project is to measure the recovery or healing level of the chronic wounds and recommend the medications further by analyzing the key parameters of the patient details at primary level (i.e., Blood Pressure, Blood glucose level, Other Physical examinations) and categorizing the observation which helps system to recommend the medication procedure for further course of action. And the digital images were using image processing techniques like, Canny, Histogram, Sepia) which would help to distinguish the images and measure the tissues based on the digital images at pixel level.

The key objective is to provide a ease of access and portable non-invasive medication for the patients & medical teams. And also helps the medical consulting officers to categorize the severity level and the required care for further course of action for the patient. Whereas the existing system only identifies wound and does not provide its recovery status and its accuracy is also very less.

The application has been implemented over smart phones with a prototype model running on any smart phone. The results to evaluate the efficiency of the application have been encouraging with high accuracy level. Accompanied SQLite database stores all relevant patient information over the inbuilt memory. Stored information. makes possible qualitative .and quantitative tracking. of wound recovery process, which gives the medical team to take necessary information to evaluate and adjust the treatment. The current methodology has been used where the system provides ease of access, less time in processing and ease of use that other devices have failed to achieve.

**Keywords:** Wound Evaluation, Chronic Wound, Image Extraction, FC Algorithm, Pixel Calculation, Histogram.

**How to Cite:** Saravanan Lalbagathur; Dr. Shobana Devi A. (2026) Chronic Wound Healing and Recommendation Management System Based on Mobile Applications. *International Journal of Innovative Science and Research Technology*, 11(5), 501-505. <https://doi.org/10.38124/ijisrt/26may371>

## I. INTRODUCTION

The chronic wounds recovery will vary with the time due to various factors first and foremost categorizing the wounds layer. The human body bounded with different layers over the skin (i.e. Fig[A1] Epidermis, Dermis, Hypodermis) and in addition other parameters such as Blood Glucose, Blood Pressure and others parameters should be in recommended level, if it varies that will directly impact the healing process. Hence, evolution of wound area is recorded in order to assess the rate of healing and the effectiveness of recommended treatments. Traditional wound area measurements are in the form of measuring the distances of the wound edges, manual tracing and digital photography. These measurements are tending to be complex, inconsistent

and inaccurate. The chronic wounds primarily consist of a different layer of tissues and also classified as follows [*Necrotic, Sloughy, Granulating, Epithelializing*]. Basically, this system would gather the primary parameters as blood glucose and its types (i.e. Type I, Type II), blood pressure and existing illness if any which is chronic.

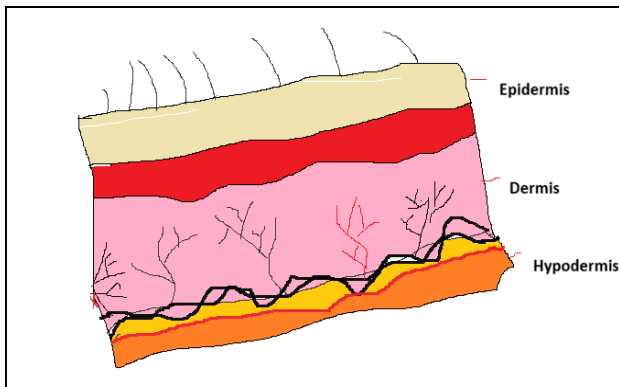


Fig 1 Skin Layers

In addition, majorly the medical officer would examine and categorize the wound. Based on the initial parameters along with the wound image will be uploaded become evaluated for further medication course of action.

And the prediction mechanism which has been used to classify with different types image to differentiate and determine the parameters over the images (i.e., sepia, mirror, Inverse, greyscale, saturation along with initial parameters (blood glucose, HBA1CA) were as used to evaluate and provide the appropriate recommendation medication details. In this report, the clinical sample of ten wound images and couple of users comparing against statistics for evaluating model.

## II. ANDROID APPLICATION

The application is primarily designed under Open-Source Platform whereas Android OS (Linux based Open Operating system) is primarily written in versatile language i.e, Java programming language for UI components controlling language and XML for designing the UI Layouts and components.

The ADT bundle was used for the application layout designs were all the supported libraries and utilities were composed as a bundle in various versions. The ADT bundle has the composed package with the simulation tools i.e., DDMS (Dalvik Debug Monitor Service) which would provide the simulation feature to ensure the mobile feature with various OS versions.

And the android application is ease of access and compatible with custom feature in terms of various parameter rather than other OS platform such as iPhone, Windows, Blackberry, Symbian etc.,

After choosing what the application will do, the developer then needs to contemplate on the initial look of the application. What the application appearance is. determines on whether a user will want to use it. The application cannot be bulky. because the user will not know what to do with it because it has. so much stuff to look at. The application. cannot be too simple because it will be. boring.

## III. EXISTING SYSTEM

The non portable wound measurement model developed by. Duckworth et al were as the user is required to draw the borders or edges manually on the touch screen over the phone. But the features and the technology advancement which we had earlier days is comparatively less and very complex in terms of making automated.

## IV. PROPOSED SYSTEM

This Project offering a compact wound surface measurement method based on the imaging techniques with digital images. Its aim to provide a practical, speedy and non-invasive technique for the patients to get medicated and helping the medical officers or clinician to observe the healing/recovery state of the chronic wounds. The initial classification can also be modified by the user, providing higher control and accuracy. The application has been implemented for the smart phones which has android features with a prototype model running on any smart phone. Accompanied SQLite database stores all relevant wound information along with user details. And further the stored information makes possible qualitative and efficient tracking of wound recovery process, which gives the appropriate information to analyze and recommendation over the medication on speedy recovery during the course of treatment with chronic condition. The current methodology tends to provides the user to become ease of use, compatible with other devices which has failed to achieve in various platforms.

When the application is started the user has to provide the basic information to do initial level of profiling with various parameter like (Blood Pressure, Mean Blood Glucose(HbA1C), History of complaints , Category of wound, BMI ) to determine and brief the wound condition and required level of medication or treatment along with a picture on the start menu you can choose to take the picture with the on- board camera or to pick it from your local system (Internal-in build phone memory / External-SD card Memory) through smart phones. The chronic wound healing analyzer application would be accessible once application has been installed in the mobile OS. The application would be accessible through menu or the installed application on the mobile phone. Once the application configured / installed user able to upload the application whereas invoking the Images (.jpg, .png, .tiff) from the device by accessing the file manger, other directory Gallery which already available in the mobile device. And also, user able capture the runtime image by clicking the camera icon under the chronic wound recovery management application

## V. BRIEFING

### ➤ Hybrid Filtering

This filtering mechanism tends to achieve the system to refer the past history which is already exist in the back-end system and further referring the content with respect to the precise parameters to categorize and provide the best high-level accuracy with 95% meeting the recommendation for further course of action.

➤ *Preprocessing Technique*

The process of removing unwanted noise and distortion over the images and optimizing the pixel parameters to enhance the image.

➤ *Canny Edge Detection*

Detecting the wider range of edges and tend to minimize the false positives and also it promotes efficiency in various level with respect to Noise reduction- which may leads to false edge detection, Gradient Calculation- which helps to compute the intensity.

**VI. ARCHITECTURE FLOW**

The architecture Fig.A represent the architecture work flow of the application and also it helps us to understand how systematically and technically functioning over the mobile platform in efficient way. And also, the application doesn't require more system memory it is compatible with all version android OS. Since it is developed and established in open-source layer compare to another platform.

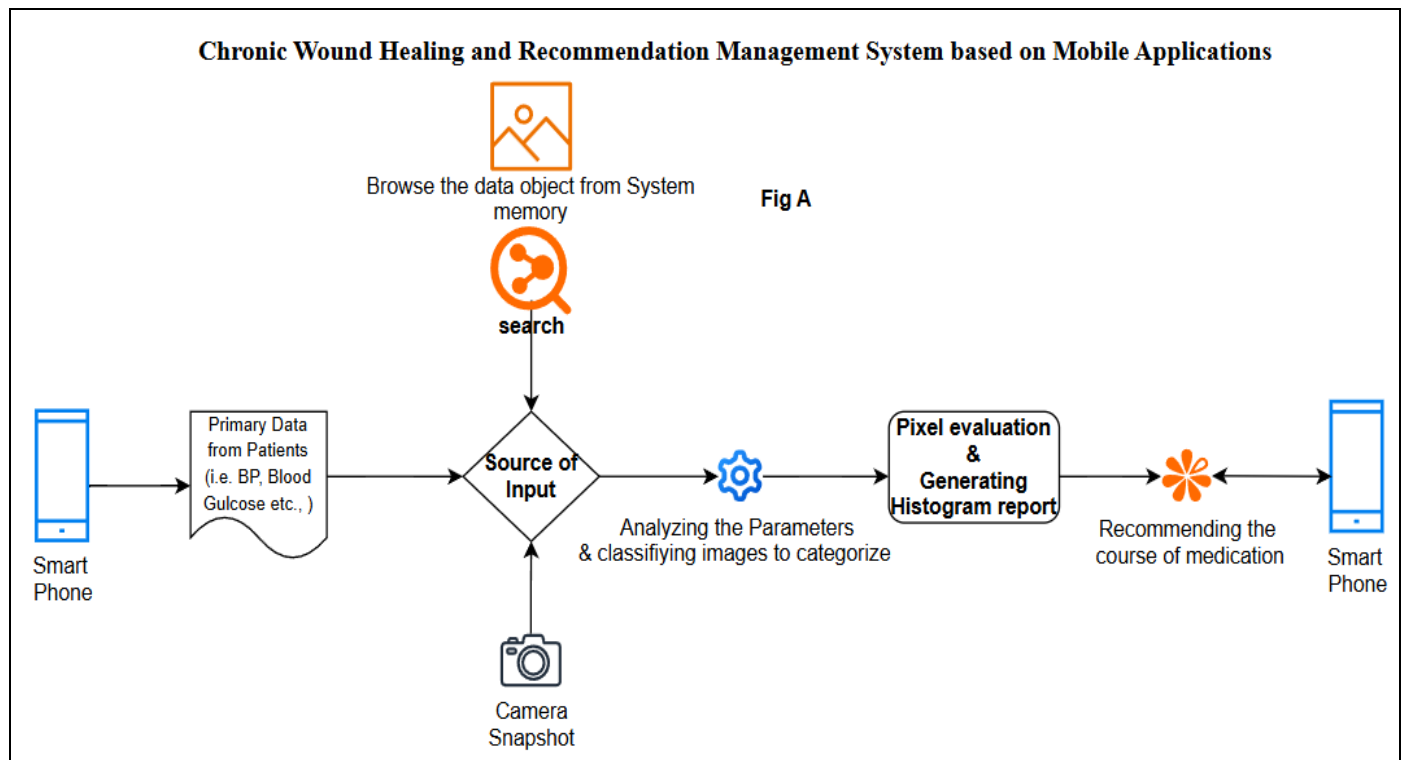


Fig 2 Architecture Flow

**VII. CONCLUSION**

This project was executed with the scope of attracting the portability, objectivity and easy of access in wound recovery management and related information's. In addition to all, an average accuracy of up to 92% could be provided through the application, along with given that camera distance, positioning and lighting effects are in consideration of measurements. And in addition to that efficient in providing the accuracy and optimized results on evaluation of the data over the wound recovery management system over wide range of diseased complaints (Diabetic Foot Ulcer, venous leg ulcers, Arterial leg ulcers, traumatic /malignant ulcers).

The Application landing at main page with the following features

➤ *Reading the Primary Details From Patient to Evaluate*

The initial parameters like Blood pressure levels, Blood glucose levels. Age factor, History of chronic disease in the family and marking the severity level by clinician between

(0-4) 0 -Minimum range on severity and 4 become the Max range on the severity level. Hence this parameter considering as key parameter.

• *For Example*

If the blood pressure is deviating from normal range 120/70mg/dl to higher or normal to lower range it will increase the risk factor of the patient. In addition to that blood glucose level exceed or deviated from the normal range high then the wound has high chance of becoming the chronic wound it is relating with insulin level with respect to the age factor also.

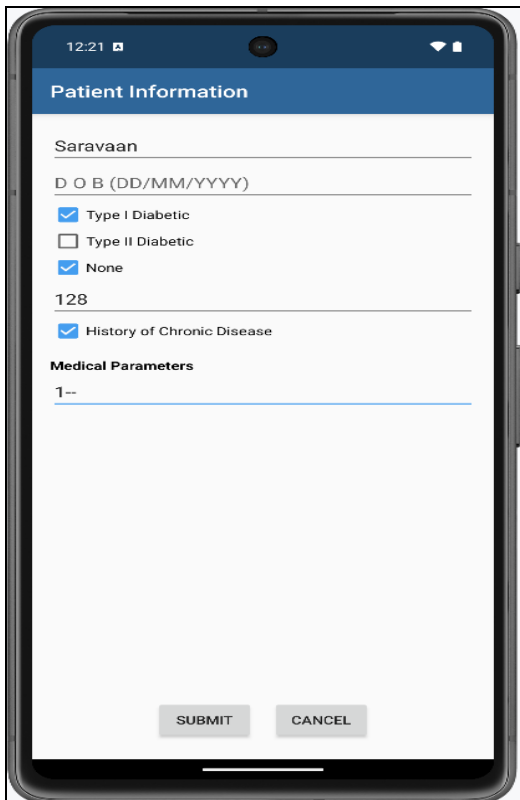


Fig 3 Camera feature to take real time wound images at run time and it will be processed for further evaluation along with the patient details

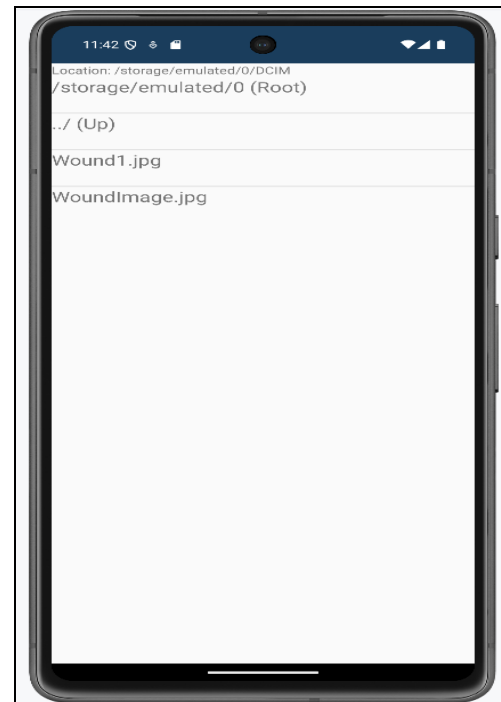


Fig 5 Upload icon used to upload the image from mounted memory Application Internal Memory path where the images can be retrieved via download or system directory



Fig 4 Search the images from the system path to fetch from the Mobile mounted memory either internal or external memory storage.



Fig 6 The loaded images would undergo for Image processing methodologies such as sepia, saturation, inverse, grayscale to distinguish and determine the wound size and categorize the chronic stages i.e., Epidermis, Dermis, Hypodermis. The categorization is rely on the severity if the severity categorized under Epidermis layer then the severity will consider as [1] and if the category fall under Dermis and severity marked as [2] the category fall under Hypodermis then the severity marked as [3] which is highest along with this parameter other primary parameter will be evaluated and the system would recommend the course of medication would be required for the same.

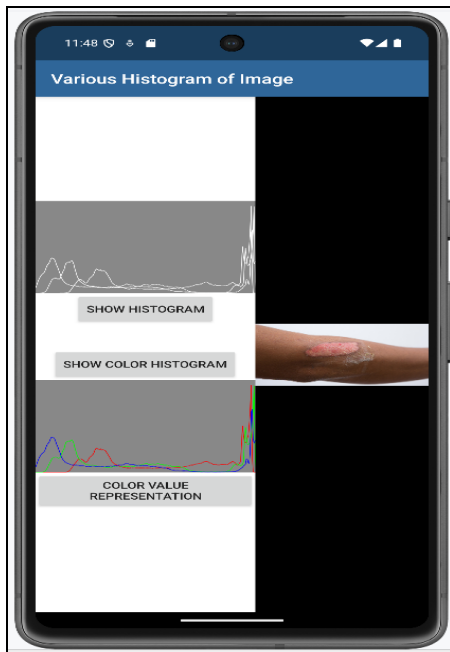


Fig 7 Histogram- value fetching for the Images with graph representation of RGB values which will help to differentiate the tissues and its occurrence.

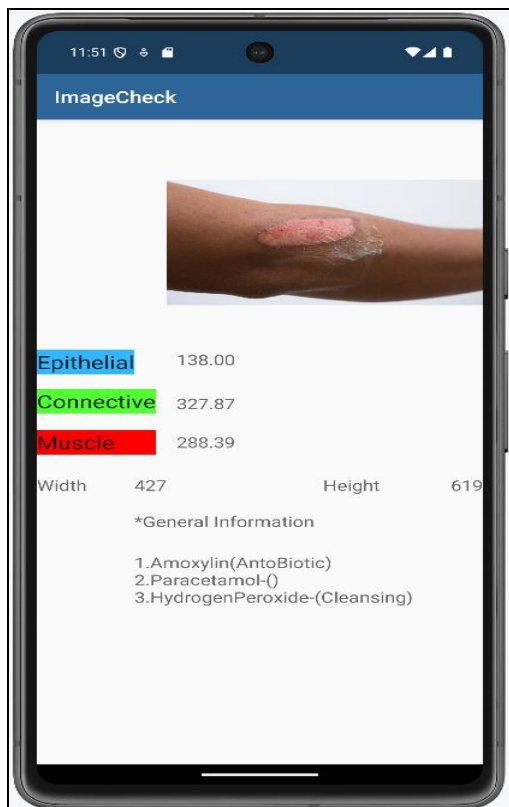


Fig 8 Recommendation system were as providing the course of medication to be taken care for the wound which is affected the epidermis layer only hence, the severity has been categorized as [1].

**FUTURE WORK**

In this project, for the first time the process is made to work relatively faster with a good accuracy rate. In the future, it could well be implemented along with Artificial

Intelligence features along with in depth analysis with computer neural networks and intelligence features. And also tending to move forward with wide usage over various departments (*i.e., Ortho, Dermatology, Radiology*) in medical industry.

**REFERENCES**

- [1]. Chan KS, Lo ZJ. Wound assessment, imaging and monitoring systems in diabetic foot ulcers: a systematic review. *Int Wound J.* 2024;17(6):1909-1923.
- [2]. Development and Clinical Uses of a Mobile Application for Smart Wound Nursing Management Qijian Zhang<sup>1</sup>, Weihong Huang, Weiwei Dai, Hanzhang Tian, Qiongfang Tang, Shihui Wang 34(6):p 1-6, June 2021.
- [3]. López-Cabrera, J.D., Ruiz-Gonzalez, Y., Díaz-Amador, R., Taboada-Crispi, A. (2021). Automatic Classification of Diabetic Foot Ulcers Using Computer Vision Techniques. In: Hernández Heredia, Y., Milián Núñez, V., Ruiz Shulcloper, J. (eds) Progress in Artificial Intelligence and Pattern Recognition. IWAIPR 2021.
- [4]. K. F. Lai and R. T. Chin, “Regularization, formulation and initialization of the active contour models (snakes)” in Asian Conf. Computer Vision, 1993, pp. 542–545.
- [5]. M. Duckworth, N. Patel, A. Joshi, and S. Lankton, “Clinically Affordable Non-Contact Wound Measurement Device” in RESNA, Phoenix, 2007.
- [6]. B. McQuiston, J. Whitestone, M. Stytz, J. Bishop, and R. Henderson, “Image Technique for Wound Assessment” Engineering in Medicine and Biology Society, IEEE 17th Annual Conference, 1995, vol. 1, pp 513-514.
- [7]. V. Aslantas and T. Mehmet, “Differential Evolution Algorithm for Segmentation Of Wound Images” in IEEE International Symposium in Intelligent Signal Processing, WISP, 2007, pp 1-5.
- [8]. T. D. Jones and P. Plassmann, “An Active Contour Model for measuring the Area of Leg Ulcers” in IEEE Transaction on Medical Imaging, vol. 19, issue 12, pp 1202 – 1210, Dec 2000.
- [9]. Kummerow Broman K, Oyefule OO, Phillips SE, Baucom RB, Holzman MD, Sharp KW, et al. Postoperative Care Using a Secure Online Patient Portal: Changing the (Inter)Face of General Surgery. *J Am Coll Surg* 2015 Dec;221(6):1057-1066.
- [10]. Feasibility of an Image-Based Mobile Health Protocol for Postoperative Wound Monitoring. Rebecca L. Gunter MD, MS, Sara Fernandes Taylor PhD, Shahrose Rahman BS, Lola Awoyinka MPH, Kyla M. Bennett MD, Sharon M. Weber MD, FACS, Caprice C. Greenberg MD, MPH, FACS, K. Craig Kent MD, FACS Wisconsin Institute of Surgical Outcomes Research, Department of Surgery, University of Wisconsin, Madison, WI Available online 19 January 2018, Version of Record 22 February 2018.