# Smart Phone App for Assessment and Processing of Foot Ulcer Images with Diabetic Patients

B.Vijaya Priya[1], G.Bhuvaneshwari[2], L.Divya[3], M.Gomathi[4], L.Madhumathi[5]

[1]Assistant Professor, Department of Electronics and Communication Engineering,  Jay Shriram group of institutions, Tirupur, Tamil Nadu, India.

[2, 3, 4,5] Department of Electronics and Communication Engineering,  Jay Shriram group of institutions, Tirupur, Tamil Nadu, India.

**ABSTRACT:** A more number of peoples are suffered to diabetic foot ulcer in this world**.** To createapp for diabetic patients and to analysis the wound. The app is implemented to the smart phone. By using MATLAB software to analysis the critical or normal of the wound by using Adaptive K-Mean algorithm. First the image is converted into standard form to assess the easy analysis. To masking and to product the surrounding of the wound.

**KEYWORDS:** Smart phone, Adaptive K-Mean Algorithm, wound analysis.

## I. INTRODUCTION

   The more number of peoples are affected by diabetic wound. The Diabetic affects the Younger ones to elders. The Diabetic is mainly categorized as Type1 and Type2. In Type1 Diabetic Insulin is generated automatically and In Type2 the insulin is generated, whenever it is required for the process of whole body. In type1,the immune system destroys the beta cells which affects the absorption of insulin from blood in right way whereas, the Type2 Diabetic is very critical disease because,the body could not able to use insulin in proper manner. We are going to analysis only Type2 Diabetics. The Diabetic Foot Ulcer is very dangerous for human life. If they people does not take care of their wounds. If the person is having Diabetic then, the person will be affected by the wound in critical level. The people can take care of the wound at the starting stage. The Patients have to visit clinic to cure the wound. There are stillwho couldn't be aware of these foot wound.

## II. LITERATURE REVIEW

In [1] deals with diabetic wound image is captured and implemented with MATLAB software by using mean shift algorithm. The wound images are segmented and colored it is used with easily identify the healing status of the wound. The smartphone with digital camera is used to capture the wound image and stored in an image capture box. The drawback is only Nexus 4 Android smart phones areused for particulars and no other smart phones are used.  Another drawback is lack of tissue classification, complexity and cost is high.

   In[2] deals with wound boundary and it  is determination by using mean shift algorithm .The healing status wound is analyze by red, black and yellow  colors. The wound images are captured with smartphone. This method is to increase the wound healing status and travelling cost is reduced. The drawback is wound images are not flexible.

   In [3] deals with wound image are captured and analyze Android smartphone using mean shift and K- mean Algorithm. This algorithm is used as a high efficient, accurate wound boundary is detected the wound image segmentation. The healing status and wound boundary is easily located with basic colors.

In [4] deals with wound image are capture the high resolution of camera to smart phone, the wounds is analyze by using mean shift Algorithm.

In [5] deals with the wound image are captured by the camera and it is segmented by using Accelerated mean shift algorithm. The healing status are analyze with colors

In [6] deals with diabetic wound image are captured and it is segmented by distance regularized level set evolution (DRLSE) method. To analysis healing status and wound area are easily identified by using K-Mean shift Algorithm.      .

## III.EXCISTING SYSTEM

The wound images are captured with high quality of digital camera and it is stored image capture box by implemented MATLAB software by using mean shift Algorithm. The image capture box is consider two block, one side is the foot is placed, the foot image are reflected to theinner side of the box. The reflected image is captured in the mobile phone. The mobile phone and PC are connected with Wi-Fi.Then the images are transfer to the PC and analysis of the foot wound. This algorithm is used only in limit applications. Nexus4 Android smart phone is only used in this algorithm and it is not used in different type of smart phone. The main drawbacks are lack of tissue classification, cost is high and complexity.The image is converted normal form with 0 to 255 pixels are analysis isvery difficult and calculating time will be increase.

## IV. PROPOSED SYSTEM

The foot ulcer is captured by the different patients. So we are moving to this technology, to overcome the drawback of the previous system. The diabetic foot wound is affected by more number of people in the world. So this technique is recover the diabetic foot ulcer. The image is captured the app using smart phone the app is created specific to analysis diabetic foot ulcer. By using MATLAB software the image is analysis by advanced algorithm of adaptive K-mean algorithm. Developed the app for diabetic patients for using analysis their wound. The app working is to capture the image by using smart phone, which has already installed the app. We can analyze the wound in depth and breadth. To analyze of the diabetic wound to known either critical or not. Then the wound is critical we can go and check the hospital, there is a not a necessary of visiting hospitals often. If it is severe wound visit hospital. The image are analysis by adaptive mean algorithm with used in wide range of application and accurate output.We are writes the coding by using MATLAB to analysis the diabetic foot wound image. First the image is converted into the standard image because easy to analysis. Then the image is outline only the foot wound because unwanted area of the foot is not analyze. Then mask with unwanted area of the image is collected only the wound area , the diabetic foot wound image is convert to the RGB because the normal color code is 0 to 255 pixels are analyze is complex so we converted to the RGB color code is 256 to 256 pixels are easy to analyze. Finally we are analyzing the depth and breadth of the wound. To know the result values we can analyze the wound stages either normal or critical.

## V.WOUND IMAGE ANAIYSIS
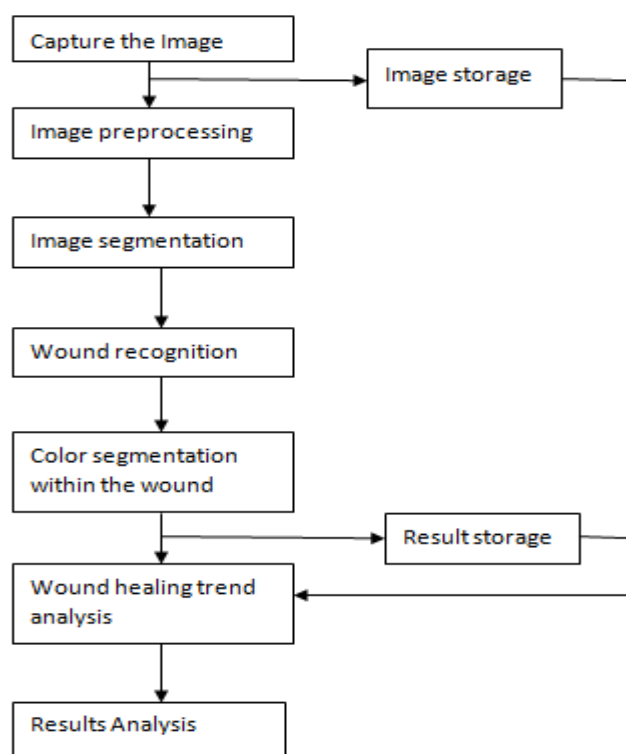
The **Image capture**process is captured analyzed by the wound image by using Smartphone and stored in JPEG file. The image is compress with binary image. The **image preprocessing**process iscaptured by wound image in order to remove the noise by using Gaussian filter. The**Image segmentation**process is the original image can be convert into RGB color image in divided by pixels (256*256).The **Wound boundary detection**process is detected by the wound in outline. The wound are identify color is used.



Figure 6.1 sample image

**Adaptive K-Mean Algorithm**

In this method,the number of clusters is predefined and wide range application is used. A large area of  research   in clustering   has focused on improving   the clustering process such that the clusters   are not dependent on the initial identification   of   cluster representation.
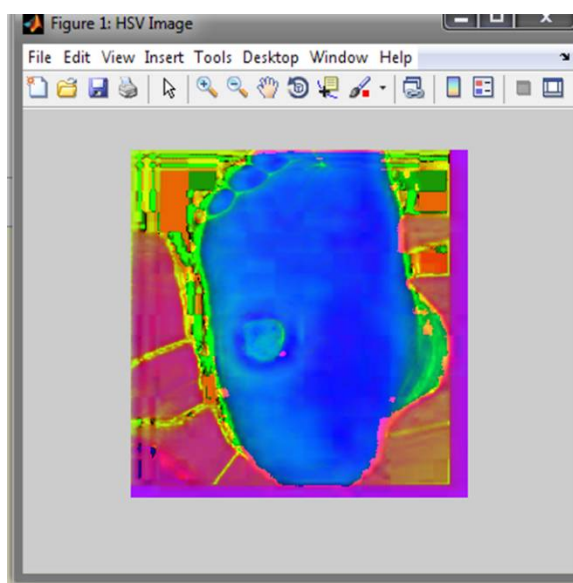


Figure 6.2 Output image

## VII.CONCLUSION

The wound is captured by smart phone app and analysis breadth and depth of the wound can be using MATLAB software. The adaptive K-mean algorithm used to analysis accurate result. This technique patients is active participants in the own care. This method is used to reduce the cost, complexity and classification of tissues. It is easy to self management of foot ulcer patients.

## REFERENCES

[1] Lei Wang, C. Pedersen, Diane M. Strong, Bengisu Tulu "Smartphone based Wound        Assessment System for Patients with Diabetes"IEEE Transaction on Biomedical Engineering, Vol. 62, No. 2, Pages. 1 -12, February 2015.

[2] V. Aishwarya, R. Chandralekha , R.Sarika , J. Shreeja , M.R. Pooja "Diabetic Foot Ulcer Assessment through the aid of Smartphone" International Journal of Computer Engineering and Applications, Vol. 10, No.4, Pages 53 – 57, April 2016.

[3]SadhanaS.JadhavProf.ManishaM.Naoghare "A Survey on Wound Assessment System Patients of Foot Ulcer Diabetes Identification Based on Smartphone" International Journal of  Innovative Research in Computer and Communication Engineering, Vol. 3, No. 11, Pages 10904 -10908, November 2015.

[4] RekhaKhokle, ShilpaPawar, Pooja Pune, SonaliJanrao " Wound Assessment System for Foot Ulcer Patients Identification based on Smartphone" International Journal of Emerging Technology and Advanced Engineering, Vol. 6, No. 9, Pages 10 – 13, September 2016.

[5] M. Saratha, V. MohanaPriya "Detection of Diabetic Wounds Based on Segmentation Using Accelerated Mean Shift Algorithm" International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 6, No. 2,Pages 201 - 206,February 2016.

[6] Lei Wang, Peder C. Pederson, Diane Strong, Bengisu Tulu, Emmanuel Agu "Wound Image Analysis System for Diabetics" International Society for Optical Engineering" Vol. 8669, Pages 866924-1to  866924-14, March 2013.