

# **SKIN DISEASE DETECTION USING IMAGE PROCESSING WITH SVM**

**PROJECT BY**

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# ABSTRACT

- Skin diseases are hazardous and often contagious, especially melanoma, eczema, and impetigo.
- These skin diseases can be cured if detected early.
- Sometimes, the doctors also fail to correctly classify the disease.
- Our system proposes a skin disease detection method based on Image Processing and Machine Learning Techniques.

- The patient needs to provide the image of the infected area and it is given as an input to the application.
- Our application uses machine learning techniques to classify the skin disease.

# OBJECTIVE

- To Develop Machine learning application that in general, has the ability to determine the affected areas in the image and to determine the disease in the specified region.

# LITERATURE SURVEY

NAME OF THE AUTHOR	YEAR	NAME OF THE JOURNAL	WORK CARRIED OUT	ALGORITHM/ DRAWBACK
. T. K. Munia, M. N. Alam, J. Neubert, and R. Fazel-Rezai	2017	Automatic diagnosis of melanoma using linear and nonlinear features from digital image	Pre-processing ,segmentation, feature extraction ,melanoma classification, melanoma validation	Accuracy of the disease is lesser
V. Pomponiu, H. Nejati, and N.-M. Cheung	2016	Deepmole: Deep neural networks for skin mole lesion classification	Skin disease, texture based feature extraction.	More complexity in the algorithm

# LITERATURE SURVEY

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A. Esteva, B. Kuprel, R. A. Novoa, J. Ko, S. M. Swetter, H. M. Blau, and S. Thrun	2017	Dermatologist-level classification of skin cancer with deep neural networks	Dermatology, image Processing, Machine Learning	It does not consider the different symptoms caused by the same kind of skin disease
M. H. Jafari, E. Nasr-Esfahani, N. Karimi, S. M. R. Soroushmehr, S. Samavi, and K. Najarian	2017	Extraction of skin lesions from non-dermoscopic images for surgical excision of melanoma	Skin disease, texture based feature extraction.	classification system performance reduces due to the effect of some classes, thereby affecting the overall performance of the system

# LITERATURE SURVEY

NAME OF THE AUTHOR	YEAR	NAME OF THE JOURNAL	WORK CARRIED OUT	ALGORITHM/ DRAWBACK
M. Emre Celebi, Q. Wen, S. Hwang, H. Iyatomi, and G. Schaefer	2013	Lesion border detection in dermoscopy images using ensembles of thresholding methods	Image acquisition, preprocessing,segmentation, feature extraction, post processing, classification	Accuracy of the disease is lesser

# EXISTING SYSTEM

- Utilized computer aided diagnosis for the purpose of segmentation of the skin lesions of images obtained from dermoscopy.
- The methodology utilized for this was thresholding it automatically, using K- means, shifting by mean , growth regionally and Gradient Vector Flow (GVF).



# PROPOSED SYSTEM

- The proposed work shows the improvement in identifying the melanoma skin cancer at different stages using image processing techniques based on active contour segmentation, Local binary Pattern and SVM classifier.
- The prime concern of the proposed work is to extract the skin image features i.e. area, perimeter and mean (R), mean (G), mean (B) and texture features.

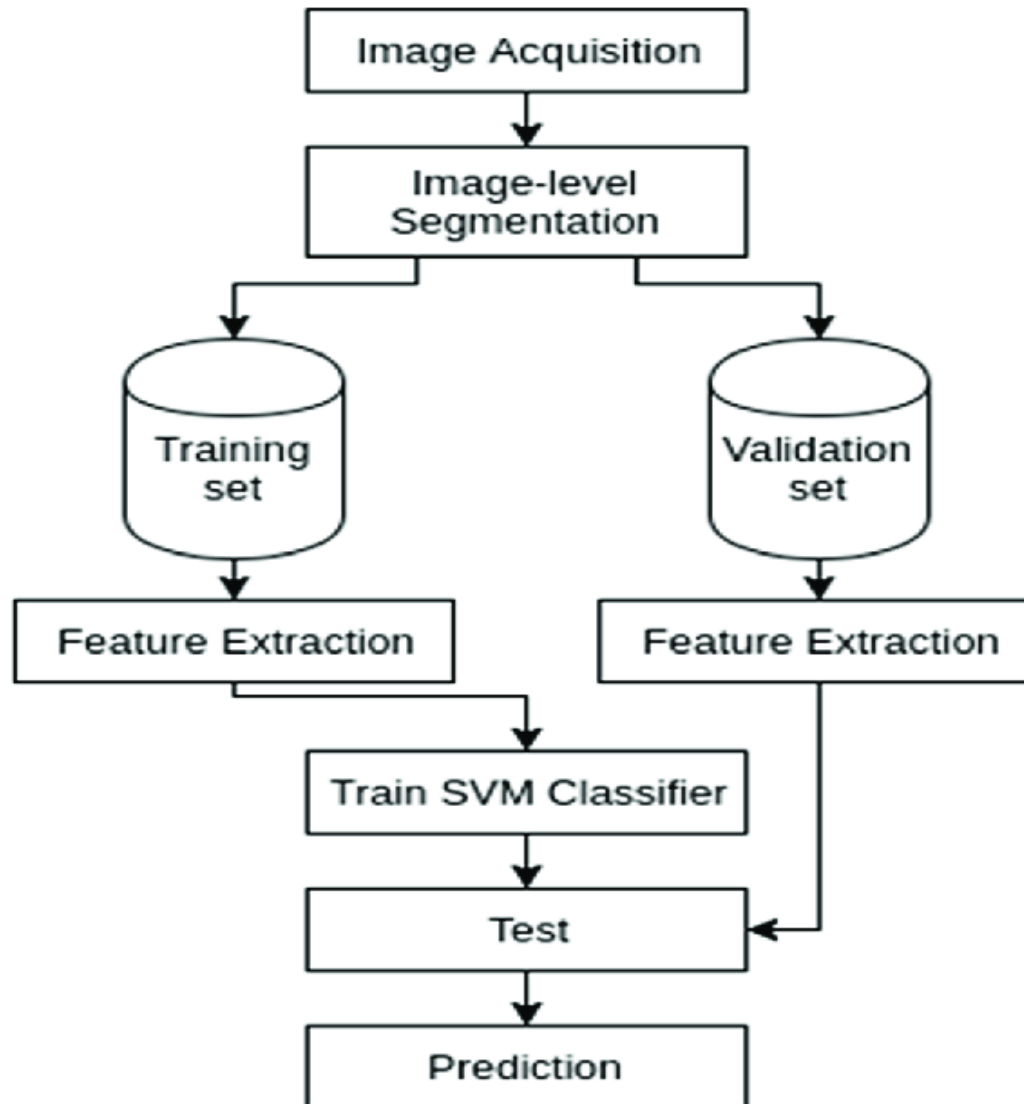
# HARDWARE REQUIREMENTS

- Hard disk: 90GB and above
- Processor: Pentium IV 2.4GHz and above
- System type: 32bit / 64 bit
- RAM: 2GB and above
- OS: Windows 7/8/8.1/10

# SOFTWARE REQUIREMENTS

- Tool : MATLAB 2019a
- Tool box : Image Processing Tool Box

# SYSTEM ARCHITECTURE



# MODULES

- Train Database
- Pre-Processing
- Segmentation
- Classification

# MODULE DESCRIPTION

## TRAIN DATABASE:

- For the training of our system, several images for each of our diseases were collected. Most of the images were downloaded from several websites and the database has been trained effectively.

# PRE-PROCESSING

- Before using the images to train our model, series of preprocessing have been applied to our data to enhance the images also to increase our data for better generalization. All these processes were implemented using MATLAB image processing toolbox.

# SEGMENTATION

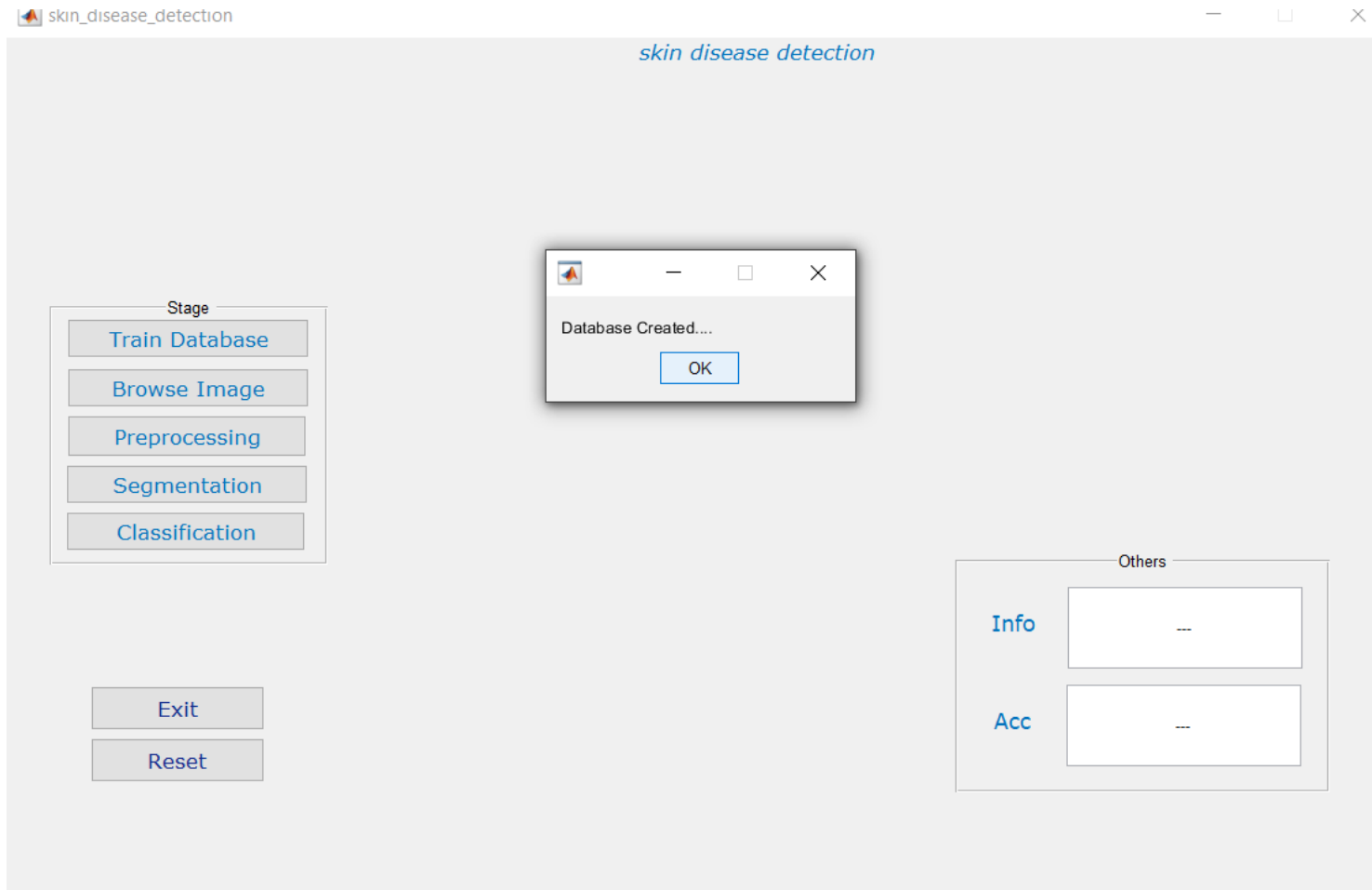
- Image segmentation is performed to separate suspicious lesion from normal skin. This is implemented through MATLAB.



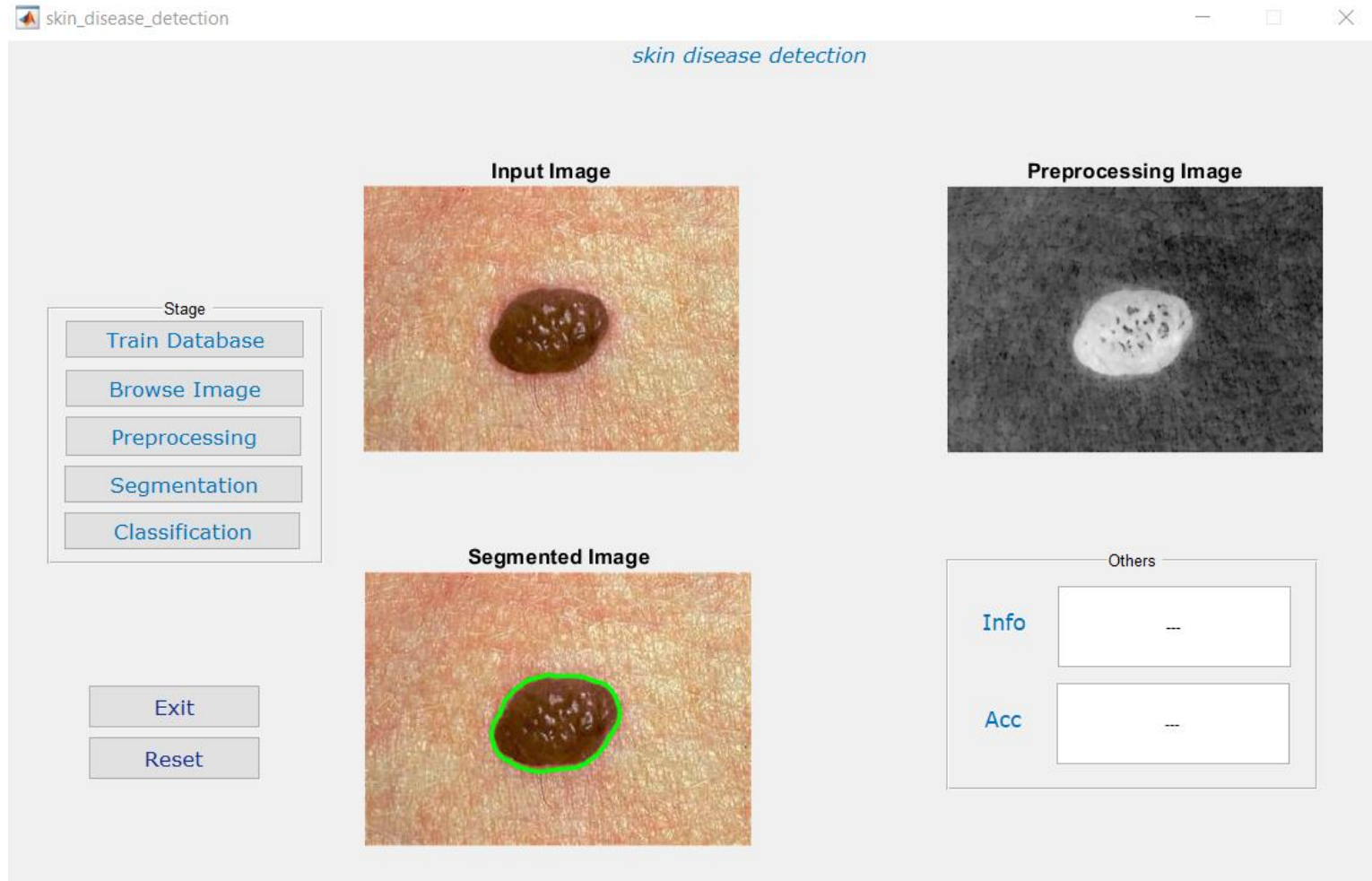
# CLASSIFICATION

- This task is to load a pre-trained model and use it to classify the input data into a suitable class of skin diseases, this function is the main function of the application.

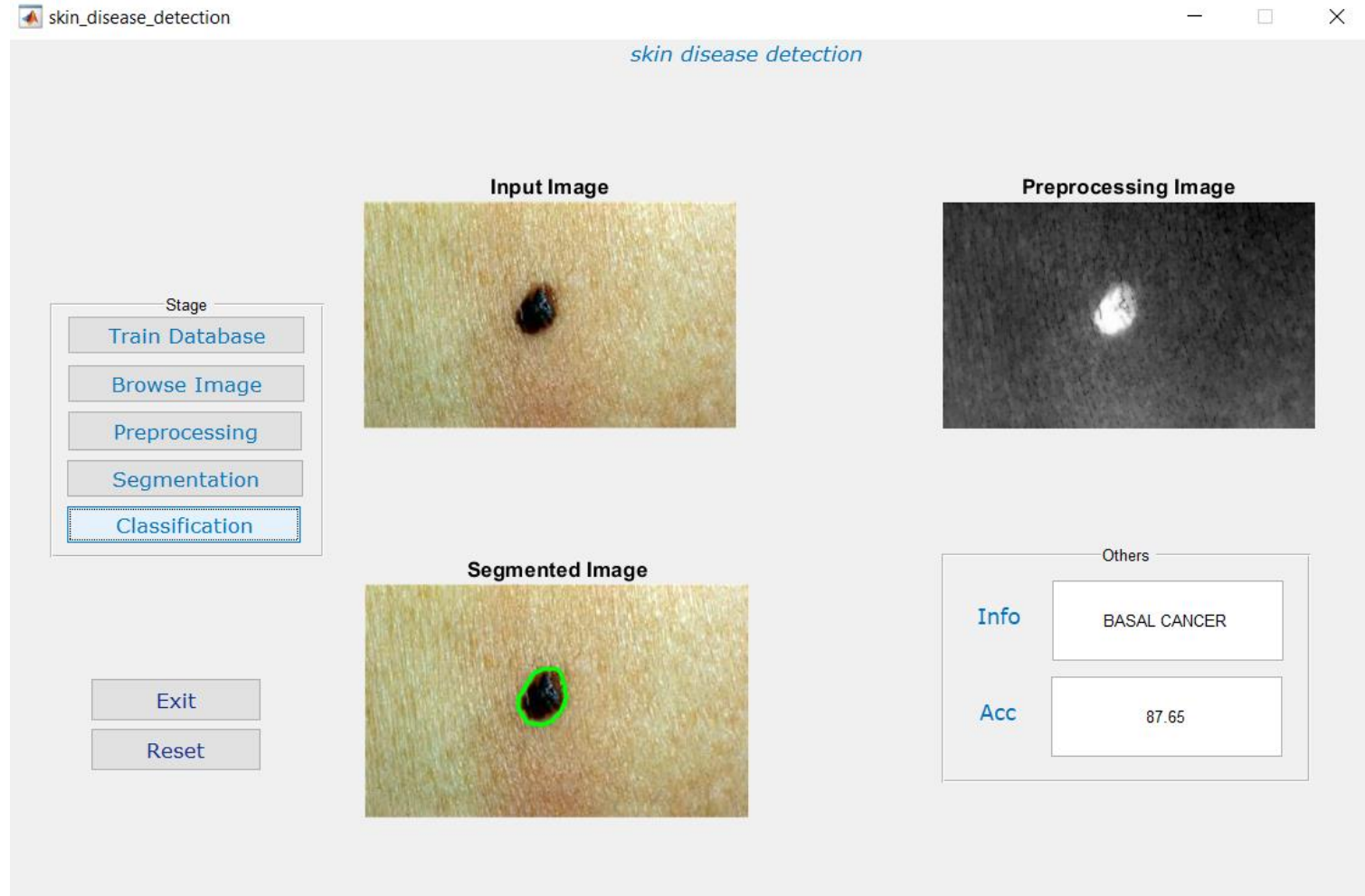
# SNAPSHOTS



# SEGMENTATION MODULE



# CLASSIFICATION MODULE



# REFERENCE

- [1] T. T. K. Munia, M. N. Alam, J. Neubert, and R. Fazel-Rezai, “Automatic diagnosis of melanoma using linear and nonlinear features from digital image,” in 2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), July 2017.
  
- [2] V. Pomponiu, H. Nejati, and N.-M. Cheung, “Deepmole: Deep neural networks for skin mole lesion classification,” in IEEE International Conference on Image Processing (ICIP). IEEE, 2016.
  
- [3] A. Esteva, B. Kuprel, R. A. Novoa, J. Ko, S. M. Swetter, H. M. Blau, and S. Thrun, “Dermatologist-level classification of skin cancer with deep neural networks,” *Nature*, vol. 542, 2017.

[4] M. H. Jafari, E. Nasr-Esfahani, N. Karimi, S. M. R. Soroushmehr, S. Samavi, and K. Najarian, “Extraction of skin lesions from non-dermoscopic images for surgical excision of melanoma,” *International Journal of Computer Assisted Radiology and Surgery*, vol. 12, no. 6, pp. 1021–1030, Jun 2017.

[5] M. Emre Celebi, Q. Wen, S. Hwang, H. Iyatomi, and G. Schaefer, “Lesion border detection in dermoscopy images using ensembles of thresholding methods,” *Skin Research and Technology*, vol. 19, no. 1, pp. 252–258, 2013.

# CONCLUSION

- Difficulties in the diagnosing skin diseases arise because of the spreading of the skin diseases all over the world.
- A computer aided system is proposed to resolve these difficulties, so a machine learning model is designed with algorithm which uses SVM as a classifier .
- The developed system performs the required work with accuracy 94% within the dataset and 85% with the external data, and the integrated system is working properly.

THANK YOU!!!