Abstract

Dermatology is one of the major field of prescription which is worried about the analysis and treatment of skin disorders. Skin diseases are among the most widely recognized medical issues around the world. Regardless of being common, their determination is quite troublesome and requires broad knowledge and expertise in the area. Skin disease might cause severe health and monetary consequences for patients if not detected and controlled early. Early recognition can forestall the condition from worsening. This research paper presents the development of an automated skin disease diagnosis system which takes images of a skin disease as an input by the user and predicts the type of skin disease. The system uses a dual stage approach for detection and prediction process which effectively amalgamates image processing and machine learning. In the 1st stage, the image of the skin condition is subject to numerous types of pre-processing techniques followed by feature extraction. The extracted features for each image are then converted to a feature vector. In the second stage, the feature vectors are fed to a machine learning algorithm (artificial neural networks) to identify disease and predict accordingly. On training and testing for 5 diseases (eczema, psoriasis, impetigo,
melanoma, and scleroderma) system produces an overall prediction accuracy of 90%.

References

1. Aarthipoornima E, Jeyaseelan T, Medical imaging modalities: A survey, in: 2016 Int. Conf. Emerg. Trends Eng. Technol. Sci., IEEE, 2016: pp. 1–4. doi:10.1109/ICETETS.2016.7603066.

2. Shervan F. E, Mohammad S, Farshad T, An Innovative Skin Detection Approach Using Color Based Image Retrieval Technique, Int. J. Multimed. Its Appl. 4 (2012) 9. doi:10.5121/ijma.2012.4305.

3. Rahat Y, Md. Ashiqur R, Nova A, Dermatological disease detection using image processing and artificial neural network, in: 8th Int. Conf. Electr. Comput. Eng., 2014: pp. 687–690. doi:10.1109/ICECE.2014.7026918.

4. Radu D, Stefan M, Dan P, Medical images classification for skin cancer diagnosis based on combined texture and fractal analysis. WSEAS Transactions on Biology and Biomedicine, July 2010.

5. Muhammad Z. A, Asghar Mj, Sheikh S, Shakeel A, Diagnosis of Skin Diseases using Online Expert System, International Journal of Computer Science and Information Security, June 2011

6. A.A.L.C. Amarathunga, E.P.W.C. Ellawala, G.N. Abeysekara, C.R.J. Amalraj, Expert System For Diagnosis Of Skin Diseases, Int. J. Sci. Technol. Res. 4 (2015) 174–178.

7. M. Shamsul Arifin, M. Golam Kibria, Adnan. F, M. Ashraful Amini, Hong Y, Dermatological disease diagnosis using color-skin images, Published in Proceedings of the 2012 International Conference on Machine Learning and Cybernetics, Xian, 15-17 July, 2012

8. Florence T,Ernest M, Fred N. K, An image-based diagnosis of virus and bacterial skin infections, International Conference on Computing and ICT Research,2011

9. Damilola A. O, Olidayo O. O, Soloman A. O, Automating skin disease diagnosis using image classification, Published in Proceedings of the World Congress on Engineering and Computer Science 2013 Vol II WCECS 2013, 23-25 October, 2013, San Francisco, USA

10. Diepgen TL, Yihune G et al. Dermatology Online Atlas. Published online at: http://www.dermis.net/doia/

11. Teck T. T, Li Z, Ming J, , An intelligent decision support system for skin cancer detection from dermoscopic images in 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD)

12. Er. Shrinidhi G, Ansari N, Ansari Z Shaikh R,An Innovative Approach for Skin Disease Detection Using Image Processing and Data Mining. In International Journal of Innovative Research in Computer and Communication Engineering.

Index Terms

Computer Science

Image Processing
Keywords

Skin diseases, pre-processing techniques, artificial neural networks