AI Based Localization And Classification Of Skin Disease With Erythema

LITERATURE SURVEY

[1] In paper 1 by Son, H.M., Jeon, W., Kim, J. *et al.* AI-based localization and classification of skin disease with erythema. *Sci Rep* **11**, 5350 (2021). https://doi.org/10.1038/s41598-021-84593-z they have used a novel method to sequentially combine accurate segmentation and classification models. Given an image of the skin, they decompose the image to normalize and extract high-level features. Using a neural network-based segmentation model to create a segmented map of the image, they cluster sections of abnormal skin and pass this information to a classification model.

[2] Another study by Philippe M. Burlina, Neil J. Joshi, Phil A. Mathew, William Paul, Alison W. Rebman, John N. Aucott, AI-based detection of erythema migrans and disambiguation against other skin lesions, Computers in Biology and Medicine, Volume 125, 2020, 103977, ISSN 0010-4825, says that they have examined the use of AI methods for detecting erythema migrans (EM) against the most clinically relevant skin conditions that may be "confusers." Early detection of EM, and diagnosis and treatment of Lyme disease, avoids potential neurologic, rheumatologic, and cardiac complications. they developed the most extensively curated dataset thus far for this challenging problem.

[3] In another paper by Huang K, Jiang Z, Li Y, Wu Z, Wu X, Zhu W, Chen M, Zhang Y, Zuo K, Li Y, Yu N, Liu S, Huang X, Su J, Yin M, Qian B, Wang X, Chen X, Zhao S, The Classification of Six Common Skin Diseases Based on Xiangya-Derm: Development of a Chinese Database for Artificial Intelligence J Med Internet Res 2021;23(9):e26025 URL: https://www.jmir.org/2021/9/e26025 DOI: 10.2196/26025 they have aimed to establish a database for AI based on the Chinese population and presents an initial study on six common skin diseases

[4] another study by Rahul Ranjan, Richard Partl, Ricarda Erhart, Nithin Kurup, Harald Schnidar, The mathematics of erythema: Development of machine learning models for artificial intelligence assisted measurement and severity scoring of radiation induced dermatitis, Computers in Biology and Medicine, Volume 139, 2021,104952, ISSN 0010-4825, developed machine learning and deep learning approaches using deep convolutional neural networks (CNNs) for automatic classification of RISRs according to the Common Terminology Criteria for Adverse Events (CTCAE) grading system. Scarletred® Vision, a novel and state-of-the-art digital skin imaging method capable of remote monitoring and objective assessment of acute RISRs was used to convert 2D digital skin images using the CIELAB color space and conduct SEV* measurements.

[5] A study by Sk Imran Hossain, Jocelyn de Goër de Herve, Md Shahriar Hassan, Delphine Martineau, Evelina Petrosyan, Violaine Corbin, Jean Beytout, Isabelle Lebert, Jonas Durand, Irene Carravieri, Annick Brun-Jacob, Pascale Frey-Klett, Elisabeth Baux, Céline Cazorla, Carole Eldin, Yves Hansmann, Solene Patrat-Delon, Thierry Prazuck, Alice Raffetin, Pierre Tattevin, Gwenaël Vourc'h, Olivier Lesens, Engelbert Mephu Nguifo, Exploring convolutional neural networks with transfer learning for diagnosing Lyme disease from skin lesion images, Computer Methods and Programs in Biomedicine, states that Lyme disease which is one of the most common infectious vector-borne diseases manifests itself in most cases with erythema migrans (EM) skin lesions. Recent studies show that convolutional neural networks (CNNs) perform well to identify skin lesions from images. Lightweight CNN based pre-scanner applications for resource-constrained mobile devices can help users with early diagnosis of Lyme disease and prevent the transition to a severe late form thanks to appropriate antibiotic therapy. Also, resource-intensive CNN based robust computer applications can assist non-expert practitioners with an accurate diagnosis. The main objective of the study is to extensively analyze the effectiveness of CNNs for diagnosing

Lyme disease from images and to find out the best CNN architectures considering resource constraints.

[6] A study on A Computational Intelligence Approach for Skin Disease Identification Using Machine/Deep Learning Algorithms Swathi Jamjala Narayanan,Pranav Raj Jaiswal,Ariyan Chowdhury,Amitha Maria Joseph,Saurabh Ambar used random Forest, KNN, Logistic Regression, Naïve Bayes, SVM, and CNN methods along with the performance measures used by the classifiers. To establish the highest accuracy rate possible for diagnosis, a comparison of the results obtained from each algorithm used is necessary. For this comparison, a common dataset with a variety of images is needed