

Accepted Manuscript

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PII: S0169-2607(16)30691-5

DOI: <http://dx.doi.org/doi: 10.1016/j.cmpb.2016.09.012>

Reference: COMM 4258

To appear in: *Computer Methods and Programs in Biomedicine*

Received date: 4-7-2016

Revised date: 11-9-2016

Accepted date: 18-9-2016

Please cite this article as: Suhail M. Odeh, Abdel Karim Mohamed Baareh, A comparison of classification methods as diagnostic system: A case study on skin lesions, *Computer Methods and Programs in Biomedicine* (2016), <http://dx.doi.org/doi: 10.1016/j.cmpb.2016.09.012>.

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A COMPARISON OF CLASSIFICATION METHODS AS DIAGNOSTIC SYSTEM: A CASE STUDY ON SKIN LESIONS

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Abstract. Background and objective: Numerous classification methods are currently available, but most of them were performed on different dataset not on same. In this paper, different classification techniques were used for a diagnostic system on different skin lesions for the same data, which gives a consistency for the data to have more accurate and better results. **Methods:** Four classification methods were proposed, a classical method based on K-Nearest Neighbour with Sequential Scanning selection technique for feature selection, a classical method with complex technique KNN with Genetic Algorithm, a complex method based on Artificial Neural Networks with Genetic Algorithm and an Adaptive Neuro-Fuzzy Inference System. **Results:** From the results obtained we can say that the performance of KNN with optimization of genetic algorithm for the feature selection was the best with an accuracy rate of 94%. The Adaptive Neuro-Fuzzy Inference System result was also good with an accuracy rate of 92%, and the other techniques results were also satisfactory. **Conclusion:** The improvement on the performance of the classifier depends on the feature selection methods. In addition, the diagnosis system as a decision support tools could be used to increase the performance of human experts to make a correct decision.

Keywords: K Nearest Neighbour; Sequential scanning techniques; Genetic Algorithm; Artificial Neural Networks; Adaptive Neuro-Fuzzy Inference System (ANFIS). Skin Cancer, and Diagnosis system.

1 Introduction

Classification is one of the most important methods and a vital tool in objects recognition and identification. There are many classification methods that are currently available; these methods can be used for categorizing multivariate data patterns. Additionally, many comparisons studies among different models were implemented, but a few of them were done on the same data sets. Hence the main purpose of this study is to compare between the different types of classification methods in order to find the best algorithm. Several classifications and feature selection methods have been used in this work on the same data set. This requires the data to be prepared in a particular and similar structure, in order to have consistent and accurate results for each classification approach. More over some classification approaches can only accept a small number of features to avoid the curse of dimensionality. The accuracy rate for successful comparison between the different

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