



MALARIA SEVERITY CLASSIFICATION THROUGH JORDAN-ELMAN NEURAL NETWORK BASED ON FEATURES EXTRACTED FROM THICK BLOOD SMEAR

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Abstract: This article presents an alternative approach useful for medical practitioners who wish to detect malaria and accurately identify the level of severity. Malaria classifiers are usually based on feed forward neural networks. In this study, the proposed classifier is developed based on the Jordan-Elman neural networks. Its performance is evaluated using a receiver-operating characteristic curve, sensitivity, specificity, positive predictive value, negative predictive value, confusion matrix, mean square error, determinant coefficient, and reliability. The effectiveness of the classifier is compared to a support vector machine and multiple regression models. The results of the comparative analysis demonstrate a superior performance level of the Jordan-Elman neural network model. Further comparison of the classifier with previous literature indicates performance improvement over existing results. The Jordan-Elman neural networks classifier can assist medical practitioners in the fast detection of malaria and determining its severity, especially in tropical and subtropical regions where cases of malaria are prevalent.

Key words: *learning algorithms, Jordan-Elman neural network, malaria, model performance, evaluation*

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1. Introduction

The tropical disease of malaria causes between one to three million deaths annually [17]. It is caused by a parasite (plasmodium) transmitted by female Anopheles

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