Review of: "A Graphical User Interface Based on Logistic Regression Approach for Malarial Detection"

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Potential competing interests: No potential competing interests to declare.

The paper focuses on the development of a Machine Learning (ML)-based prediction system for malaria detection, using three ML techniques: Logistic Regression (LR), Support Vector Machine (SVM), and Random Forest (RF). The study aims to predict the presence of malaria in individuals using a dataset of 350 records, and it introduces a graphical user interface (GUI) based on LR to aid in diagnosis. The paper highlights the time efficiency of the GUI compared to traditional methods used by malaria experts. The introduction effectively sets the context by discussing the global challenge posed by malaria, a mosquito-borne disease caused by the Plasmodium parasite. The global statistics about malaria cases and deaths provided by the World Health Organization (WHO) in 2022 underline the severity of the issue. The introduction emphasizes the need for timely and accurate diagnosis and points to various ML-based models developed for disease prediction. Key points addressed:

- The historical development of mathematical models for malaria transmission, starting from the SIR (Susceptible-Infected-Removed) model.
- The role of mathematical and ML models in improving diagnosis and prediction accuracy.
- A brief overview of several ML techniques used in malaria prediction, with a focus on the cost-effectiveness of text-based models versus image-based models.

This section sets up the purpose of the research: to investigate ML techniques (LR, SVM, RF) for predicting malaria using a text-based dataset, as opposed to more expensive image-based approaches. The experimental results show that Logistic Regression (LR) outperforms the other two algorithms (SVM and RF) in all the evaluation metrics—accuracy, precision, recall, and F1-score.

- GUI Development: A significant contribution of this study is the development of a graphical user interface (GUI) that uses LR for predicting malaria. The GUI is highlighted as being faster than traditional expert-based methods, which may improve the efficiency of medical professionals in diagnosing malaria.

- Model Performance: The performance of LR stands out, providing more reliable and timely predictions compared to SVM and RF. The authors also note that although the results are promising, they are based on a small dataset, which limits the generalizability of the findings.

Areas for Improvement

1. Future research with larger, more varied datasets would strengthen the findings.
2. The paper focuses on three ML techniques, but including other classifiers or deep learning approaches might further refine the accuracy of predictions.
3. Validation of the developed model using real-world data from multiple regions and healthcare settings could help in assessing its practical deployment.