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Malaria Parasite using CNN

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Abstract: *This study looks into the viability of using CNN to automatically detect malaria parasites in thick blood smears. Techniques: We have created the first deep learning technique that works on cellphones and can identify malaria parasites in thick blood smear photos. Our process entails two steps of processing. First, we use a quick screening method called an intensity-based Iterative Global Minimum Screening (IGMS).using a thick smear picture to identify potential parasites. Then, each candidate is categorised as either parasite or background using a customised Convolutional Neural Network (CNN). With this study, we create a dataset that is 1819 thick.150 patients' smear photos made available to the public scientific community. This dataset served as our training and evaluate the deep learning approach we used in this paper. Results: A patient-level five-fold cross-evaluation shows the customised CNN model's effectiveness in differentiating between positive (parasitic) and negative image patches in terms of the performance indicators of accuracy (93.46 percent 0.32 percent), AUC (98.39 percent 0.18 percent), sensitivity (92.59 percent 1.27 percent), specificity (94.33 percent 1.25 percent), precision (94.25 percent 1.13 percent), and negative predictability. High correlation coefficients (>0.98) between ground truth and automatically discovered parasites, at both the patient and picture level, show the effectiveness of our technology. Conclusion: Positive outcomes deep learning techniques, results are produced for parasite detection in thick blood smears. Meaning: Automated parasite detection operating on smartphones offers a promising substitute for manually counting parasites to diagnose malaria.*

Keywords: Deep learning, convolutional neural networks, computer-aided diagnosis, malaria.

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