

Automated Diagnosis of Malaria with Scale Invariant Feature Transforms and Cascades of Boosted Classifiers

by

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Abstract

In recent years, many research have been devoted to the exploration of techniques of malaria diagnosis; however, few have devoted time to automated diagnosis using computer vision

techniques. In fact, no attempts have been made in the use of Scale Invariant Feature Transforms (SIFT) and Haar cascades for malaria diagnosis. Likewise object detection in images has been well studied in computer vision for years. However, given the complexity of large variations of the appearance of the object and the background in microscopic images of a blood smear, a robust and efficient detection is still considered as an open and challenging problem. This dissertation therefore presents approaches of developing malaria diagnosis with the SIFT and Haar cascade features. Thick blood smear was used and parasite regions within the image were extracted and trained. The performance evaluations of the SIFT diagnostic methodology being at sensitivity of 98.78% and the cascade methodology being at sensitivity of 99.70% against other computer vision techniques demonstrate the promise and superiority of these approaches in terms of malaria diagnosis.

Keywords:

Scale Invariant Feature Transforms (SIFT), Haar cascade features, Malaria, Malaria Diagnosis, Computer Vision, Automated Diagnosis