

AUTOMATIC DETECTION OF MALARIA IN BLOOD SMEARS USING SMARTPHONES

MALARIA SCOPE



THE MAIN OBJECTIVE OF THIS PROJECT IS TO DEVELOP A MOBILE-BASED SOLUTION FOR THE EFFECTIVE DETECTION OF MALARIA IN HUMAN BLOOD, FOR PEOPLE IN DEVELOPING COUNTRIES WITH LIMITED MEDICAL SKILLS.



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µSmartScope

The project aims to develop a cheap alternative to the current microscopes, that can easily be adapted to a smartphone and to be used in the field.

The goal is to place the smartphone in the adapter along with the blood smear, and use the built-in camera to capture a set of magnified images. This images will then be processed, analyzed and provide the patient pre-diagnosis.

Automatic Analysis

We currently investigate computer-aided methods based on machine-learning that can be used for the successful automatic analysis of malaria-infected blood smears. The main objective of this component will be the development of an image processing and analysis module designed for:

 The determination of the parasite density in a blood sample (number of parasitizes per microliter); The identification of the species and lifecycle stage of the detected parasite.

Major focus is being given to the detection of *P. falciparum, P. ovale* and *P. malariae, the species with current significant clinical incidence in sub-Saharan Africa.*

Applications

Microscopic examination is the gold standard for malaria diagnosis, which is an exhaustive and time consuming activity that requires considerable expertise of the healthcare workers.

The MalariaScope system has the potential to work as a first triage framework for isolated laboratories, where a technician with limited special skills for malaria diagnosis collects blood from a patient, prepares the blood smear and uses the system to analyze the blood sample in order to provide the correct medication.



MalariaScope

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