# Malaria Dectection Using Deep Learning

**BACHELOR OF TECHNOLOGY**

Information Technology

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Jan-june 2022


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# Contents

# 1 Introduction

Malaria disease originated from Plasmodium parasites through mosquito-borne infection. Malaria is very common over the world mainly in tropical regions. Malaria is widely spread across the globe. When infected female Anopheles mosquitoes bite a person, the parasites enter into the blood and begin damaging red blood cells (RBC) that carry oxygen. Flu virus is the malaria's first symptom. The symptom generally starts in few days or weeks. Most importantly, the lethal parasites can stay alive more than a year in a person's body without showing any symptoms. Therefore, a late treatment can cause complications and even death. Hence, many lives can be saved through early malaria detection. Almost 50% of the population in the world is in danger from malaria. There are more than 200 million malaria cases and 400,000 deaths reported every year due to malaria. In practice, to identify malaria, microscopists inspect blood (thick and thin) smears for disease diagnosis and calculate parasitemia. Microscopy examination is used as one of the prime standards for the diagnosis of malaria [1, 2] to identify the existence of parasites in a blood drop from thick blood smears. However, thin blood smears are used for distinguishing the species of parasite and the development of malaria stages. Examination through a microscope is commonly used since it is cheap but time-consuming. The examination accuracy relies on the quality of blood smear and a skilled person who is expert in the classification and examination of uninfected and parasitized blood cells.

Cognitive computing replicates the way humans solve problems while artificial intelligence and machine learning techniques search for creating novel ways for solving problems that humans can potentially do better. A substantial amount of research has been done during the last decades using machine learning algorithms for cost-effective solutions to support healthcare professionals in reducing diseases.

**Rationale**:Traditional approaches for malaria detection are **very time-consuming,** may produce inaccurate reports due to **human errors**, and are laborious for extensive diagnoses. This motivates us to propose an automatic detection of malaria applying deep learning techniques and using a mobile application that leads to early diagnosis which is fast, easy, and effective.

## 2 Objectives

1. To automate rhe prediction of malaria diseases in human being.

2. To minimize the human error in the prediction process.

3. To minimize the time and effort required in the prediction process.

# 3 Feasibility Study

**Technically feasible:** This software is very much technically feasible. This software is very much concerned with specifying equipment and the software will successfully satisfy almost all the admin's requirements. The technical need for this system may vary considerably but might include:

a. The facility to produce output in a given time.

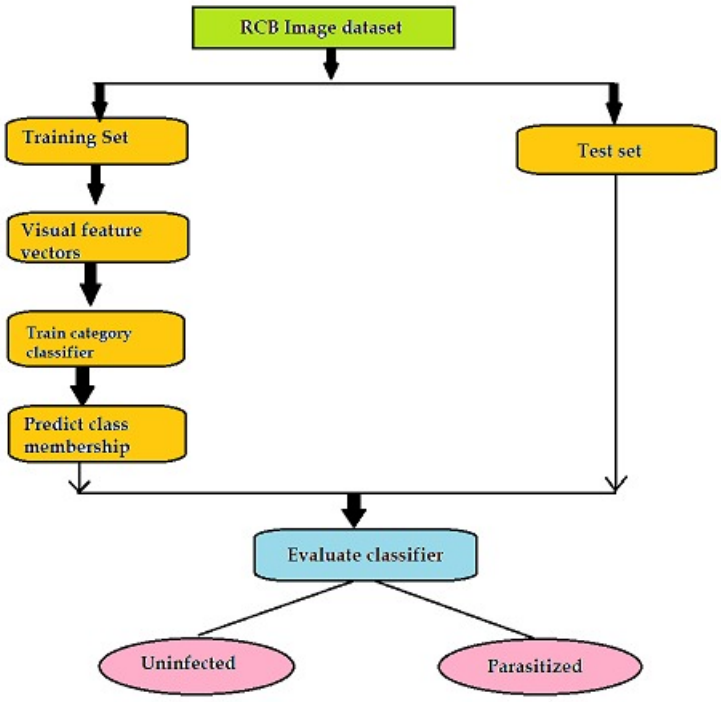
b. Response time under certain conditions.

Therefore, the basic input/output of data is identified. So, the project can easily be build up and it will also be technically feasible

**Economic Feasible**: The project is very much financially feasible. Moreover, it requires some training for the use. So, training cost can be neglected and the resources of this software are very much available. It also reduces the labour and extra cost to be paid for labour. So indeed, it is financially feasible.

# 4 Methodology/ *Planning* of work

Deep learning techniques are now widely used for image classification, video recognition, and medical image analysis. A convolutional neural network (CNN), a type of deep neural networks, is mainly considered for research in computer vision field. The deep architecture of CNN is its main power. The convolutional layer in the CNN works as an automatic feature extractor that extracts hidden and important features. Extracted features are passed to a fully connected neural network which performs classification images by maximizing the probability scores.



# 5 Facilities required for proposed work

Software/Hardware required for the development of the project.

**Software Requirement :**

1. Operating System:- Application can run from any operating system supportingmodern browsers Edge, Firefox, Chrome, Safari, etc

2. Frontend Technologies :-

**Hardware Requirement :**

Component Minimum Requirement

Processor 1.9 gigahertz (GHz) x86- or x64-bit dual core processor

Memory 2GB RAM

Display Super VGA with a resolution of 1024 x 768

**Project Category:** ML Based ,Deep learning

**Tool Required :**

Operating System: Windows 10

IDE : JupyterLab, collab

**Hardware Required:**

Processor: Intel core i5 RAM: 2GB Hard Disk: 1TB

# 6 References


**1.** World Health Organization. WHO Malaria Policy Advisory Group (MPAG) Meeting: Meeting Report; April 2021; World Health Organization: Geneva, Switzerland, 2021.

**2.** Abubakar, A.; Ugail, H.; Bukar, A.M. Assessment of human skin burns: A deep transfer learning approach. J. Med. Biol. Eng. 2020, 40, 321–333. [CrossRef]

**3.** Lowd, D.; Davis, J. Improving Markov network structure learning using decision trees. J. Mach. Learn. Res. 2014, 15, 501–532.

**4.** Anuradha, J.; Ramachandran, V.; Arulalan, K.; Tripathy, B. Diagnosis of ADHD Using SVM Algorithm. In Proceedings of the Third Annual ACM Bangalore Conference, Bangalore, India, 22–23 January 2010; Association for Computing Machinery: New York, NY, USA, 2010; pp. 1–4.