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# Detection of Female Anopheles Mosquito-Infected Cells: Exploring CNN, ReLU, and Sigmoid Activation Methods

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## Abstract

INTRODUCTION: Deep learning uses multi-layer neural networks where the algorithm decides for itself whether aspects are essential for analysis based on the raw input. In general, deep learning networks get better as more data is used to train them. For a variety of applications, convolutional neural networks are frequently used to analyse, categorize, and detect images.
OBJECTIVES: The proposed system technique is used for automated analysis of malaria-detecting frameworks. A female Anopheles mosquito bite is the primary method of transmission of the blood disease malaria. It is still common to manually count and identify parasitized cells during microscopic examination of either thick or thin layers of haemoglobin, which takes time for disease prognosis.
METHODS: The current research uses a neural network based on convolution to catalogue images of cells with and without malaria infection. This method improves the precision of classification for the datasets under study. The ReLu activation function used by this model enables it to learn more quickly and perform more effectively.
RESULTS: The prediction of infected and healthy cells was done accurately by the proposed model, which uses only 3 layers of convolution, and this was the idea behind the implementation. The model achieved an improved accuracy of 99.77% across 12 iterations (epochs).
CONCLUSION: The proposed model is straightforward and successful in differentiating between malaria-infected and uninfected cells.

**Keywords:** ReLU, CNN, Sigmoid activation layer, Image classification

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## 1. Introduction

Deep learning is a significant area of research currently since it makes use of a lot of facts, numerous machines, and several methods. Deep learning techniques are applied in the prediction and development of illness based on locomotion, speech, information about facial expressions, cell pictures, and other factors [1]. The structure and operation of the human brain have an impact on deep learning. In order for us to comprehend the information we encounter; the human brain structure is made up of an immense number of nerves that are connected, exchange information, and communicate with one another. In order to distinguish and categorise various objects or properties in images, intensively programmed neural networks, like neural networks in biology, comprise neurons with changeable weights and biases [2]. It is necessary to have a suitable archive for preserving the image data because the number of pictures and video recordings recorded at various events is increasing. Due to the vast amount of data and diversity of the visual content, it is challenging for a computer to