

# Web Application for Detection of Malnutrition Detection (Using Image Processing and Neural Network)

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**Abstract:** *The use of images of people and data analysis, we are extending the idea of illness detection on the human body in this project. The process for illness identification in this study is as follows: A picture of youngsters serves as the system's input. The system will analyse photos and extract features that may be used to diagnose diseases from those images. Here, machine learning is used to produce the initial set of training data from a picture of a patient with a certain illness. The training data set is used to compare a feature that was taken from the input picture. In this study, we discovered that the training set data and the image's colour feature match perfectly.*

**Keywords:** Machine Learning, Malnutrition, Disease Detection, Tensorflow, Data Analysis

## I. INTRODUCTION

Malnutrition is a major problem, especially in developing nations. It happens when someone consumes a diet deficient in important nutrients or does not get enough nourishment. Particularly in children, malnutrition can have serious repercussions such as reduced growth, developmental delays, and increased susceptibility to sickness. An Android app for malnutrition diagnosis utilizing image processing and neural networks might be created to address this problem. The software would enable users to take a photo of a kid and then analyze it for any physical indications of malnutrition, such as a bloated abdomen, skinny limbs and legs, or a wan face. The picture data would then be sent into a neural network, which would analyze the image's properties and offer a nutritional status evaluation for the youngster. To increase the accuracy of its predictions, the neural network might be trained on a vast collection of photographs of starving and healthy youngsters. If required, the programme might potentially prescribe dietary adjustments or direct the user to a healthcare expert for further examination and therapy. Furthermore, the programme might collect data on the incidence of malnutrition in various locations, assisting in identifying places where aid is most required.

## II. PROBLEM STATEMENT

The suggested Android application for malnutrition diagnosis utilizing image processing and neural networks is motivated by the significant prevalence of malnutrition, particularly in developing nations. Malnutrition can have serious implications, especially in children, such as stunted growth, developmental delays, and an increased susceptibility to sickness. However, due to a lack of healthcare services in these locations, identifying and treating malnutrition in a timely manner is challenging. The proposed invention attempts to address this issue by offering a simple and easy-to-use instrument for detecting childhood malnutrition and enabling early intervention and treatment.

## III. MOTIVATION AND OBJECTIVE

### 3.1 MOTIVATION

Our Android application for malnutrition diagnosis take image processing and neural networks is motivated by the need to enhance the health outcomes of children in poor nations who are at danger of malnutrition. Malnutrition is a major problem in many communities, with severe and long-term repercussions, particularly for young children. However, due to a lack of healthcare resources and skilled personnel in these areas, identifying and treating malnutrition in a timely

manner is challenging. The proposed application intends to create a Easy and accessible tool that any individual with a smartphone may use for recognizing childhood malnutrition, allowing for early intervention and treatment.

The application may give reliable evaluations of a child's nutritional condition by utilizing image analysis and neural networks, which will help determine areas where intervention is most required. The application has the potential to enhance children's health outcomes in developing nations, lower the prevalence of malnutrition, and ultimately save lives.

### 3.2 OBJECTIVE

By obtaining Following goals, Our application has the potential to improve the health outcomes of malnourished children, reduce an Increasing rate of malnutrition in developing nations, and ultimately save lives.

- To recognize physical symptoms of malnutrition in children, such as a bloated abdomen, skinny limbs and legs, or a wrinkled face, using image processing techniques.
- To analyse the image's attributes and offer an accurate evaluation of the child's nutritional state using a neural network.
- To give information on suggested modifications to diet or, if necessary, to direct the user to a healthcare professional for further examination and treatment.
- Gathering statistics on the prevalence of malnutrition in different regions in order to identify places where help is most required.

### IV. LITERATURE SURVEY

SR. NO.	NAME	AUTHOR	PUBLICATION	YEAR	Limitation
1]	Malnutrition Detection using Convolutional Neural Network.	Arun Raj Lakshminarayanan	IEEE	2021	The method only predicts the malnutrition status of the child but how to overcome the problem remains a question.
2]	Detect Malnutrition in Underage Children by using TensorFlow Algorithm of Artificial Intelligence	Neha Kadam	IRJET	2022	This may give a more accurate result for identifying human health conditions using the machine learning algorithm.
3]	An Innovative WEB APPLICATION to Predict Malnutrition and Anemia using ML	Kavya Priya M	IJAR CCE	2021	The data set considered here is quite small. Hence the results are not reliable.

### SURVEY OF EXISTING SYSTEM:

Several existing systems for the detection of malnutrition using machine learning. Here are a few examples:

- Malnutrition detection using anthropometric measurements: This is a traditional approach for the detection of malnutrition. Anthropometric measurements such as height, weight, and mid-upper arm circumference (MUAC) are used to identify malnutrition in individuals. However, this approach can be time-consuming and requires trained personnel.
- Malnutrition detection using computer vision: Computer vision techniques can be used to detect malnutrition by analyzing images of individuals. Convolutional neural networks (CNNs) can be trained to detect features of malnutrition in images such as thinness, wasting, and stunting.
- Malnutrition detection using mobile WEB APPLICATIONS: Mobile WEB APPLICATIONS can be used to collect data on individuals and detect malnutrition. These WEB APPLICATIONS can use a combination of anthropometric measurements and computer vision techniques to identify malnutrition.

- Malnutrition detection using wearable sensors: Wearable sensors can be used to continuously monitor an individual's nutritional status. These sensors can track factors such as body composition, physical activity, and food intake to identify malnutrition.

Overall, the existing systems for the detection of malnutrition using machine learning are diverse and offer different advantages and limitations. Further research is needed to develop more accurate and efficient systems for the early detection and prevention of malnutrition.

## V. METHODOLOGY

### 5.1 PROPOSED SYSTEM

The Web Application for detection of malnutrition detection using image processing and neural networks would include the following components:

- **User interface:** - The software would include an easy-to-use UI that would allow the user to upload a photo of the child's face, arms, and legs with the smartphone camera.
- **Image processing:** - Image processing techniques would be used in the program to detect physical indicators of nutrition in child's Picture. This might entail segmenting the image to concentrate on certain areas of interest, such as the child's face.
- **Neural network prediction:** - After processing the image, the neural network would analyze the image's attributes and deliver an accurate estimate of the child's nutritional state. The neural network's output might be a probability score or a categorical prediction indicating whether the infant is malnourished or not.
- **Recommendation and referral:** - Based on the forecast, the Web Application would make recommendations for dietary adjustments or, if necessary, direct the user to a healthcare expert for further examination and treatment.
- **Data Collection** :- The project might also collect data on the prevalence of malnutrition in various locations, which could be used to pinpoint areas in which help is most required. This information might be utilised to help shape public health policies and activities.
- **Awareness and education** :- The app might also incorporate information on the repercussions of malnutrition, as well as the need of early intervention and treatment, especially in developing nations. This might aid in raising awareness and encouraging behaviour change. The suggested approach, by including these components, would provide a simple and accessible tool for diagnosing malnutrition in children, particularly in impoverished nations where access to healthcare services is restricted. The Web Application might eventually improve the health outcomes of malnourished children, lower the prevalence of malnutrition in developing nations, and save lives

### 5.2 ALGORITHM

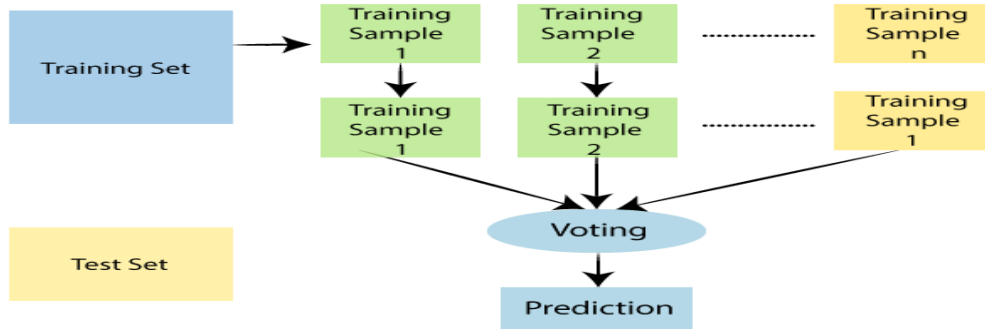
#### Random Forest

It is an open-source software framework for dataflow and differentiable programming that may be used to perform a broad range of tasks. It is widely used in both research and business to develop machine learning models, especially deep learning models.

It can be used as a machine learning framework in the Web Application for detection of malnutrition detection using image processing and neural networks.

Here's how random forest can be incorporated:

1. Training the neural network.
2. Incorporating algorithm in the Web Application
3. Image processing.
4. Neural network prediction.
5. Providing information and referral



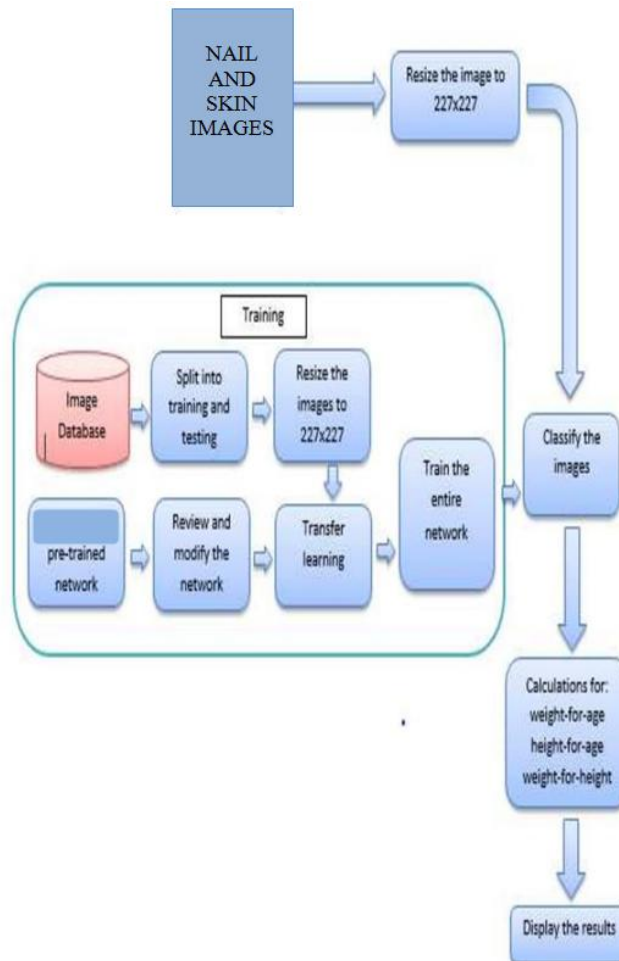
### 5.3 FRAMEWORK

#### Django

A framework is a pre-built software structure that provides a foundation for developing software applications. It provides developers with a set of tools, libraries, and templates to streamline the development process and reduce development time. Frameworks often contain built-in features and functionalities that are commonly required by many applications, such as user authentication, database connectivity, and session management.

Django is a popular web framework for building web applications using Python. It provides developers with a set of tools and libraries for creating web applications quickly and efficiently.

### 5.4 FLOWCHART

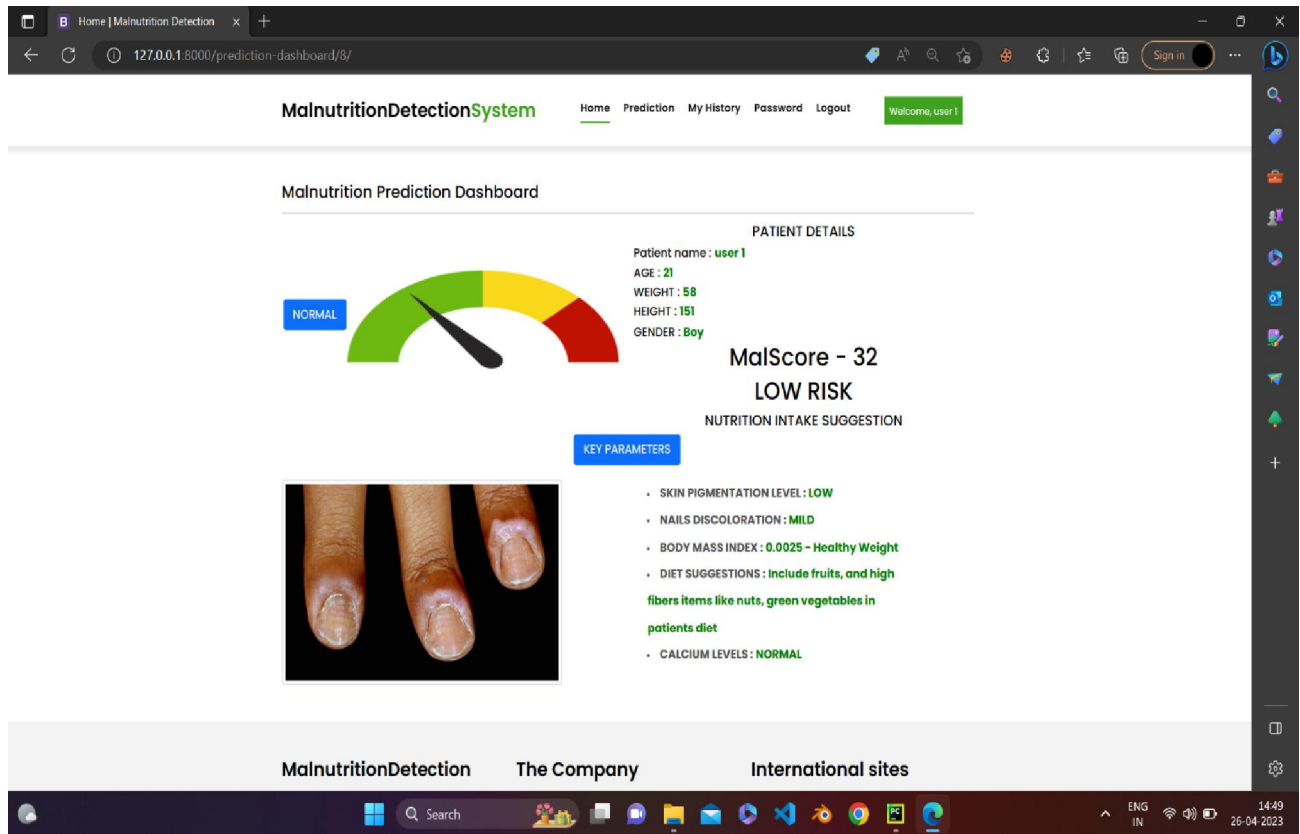


**SOFTWARE USED**

Name of Component	Specification
Operating System	Window 11.
Language	Python
Dataset	CREATED BY TEAM
Technologies used	CNN, RANDOM FOREST.
Browser	CHROME

**VI. RESULT**

**DETECTION OF MALNUTRITION**



**MalnutritionDetectionSystem** Home Prediction My History Password Logout Welcome, user 1

Malnutrition Prediction Dashboard

**PATIENT DETAILS**  
 Patient name : user 1  
 AGE : 21  
 WEIGHT : 58  
 HEIGHT : 151  
 GENDER : Boy

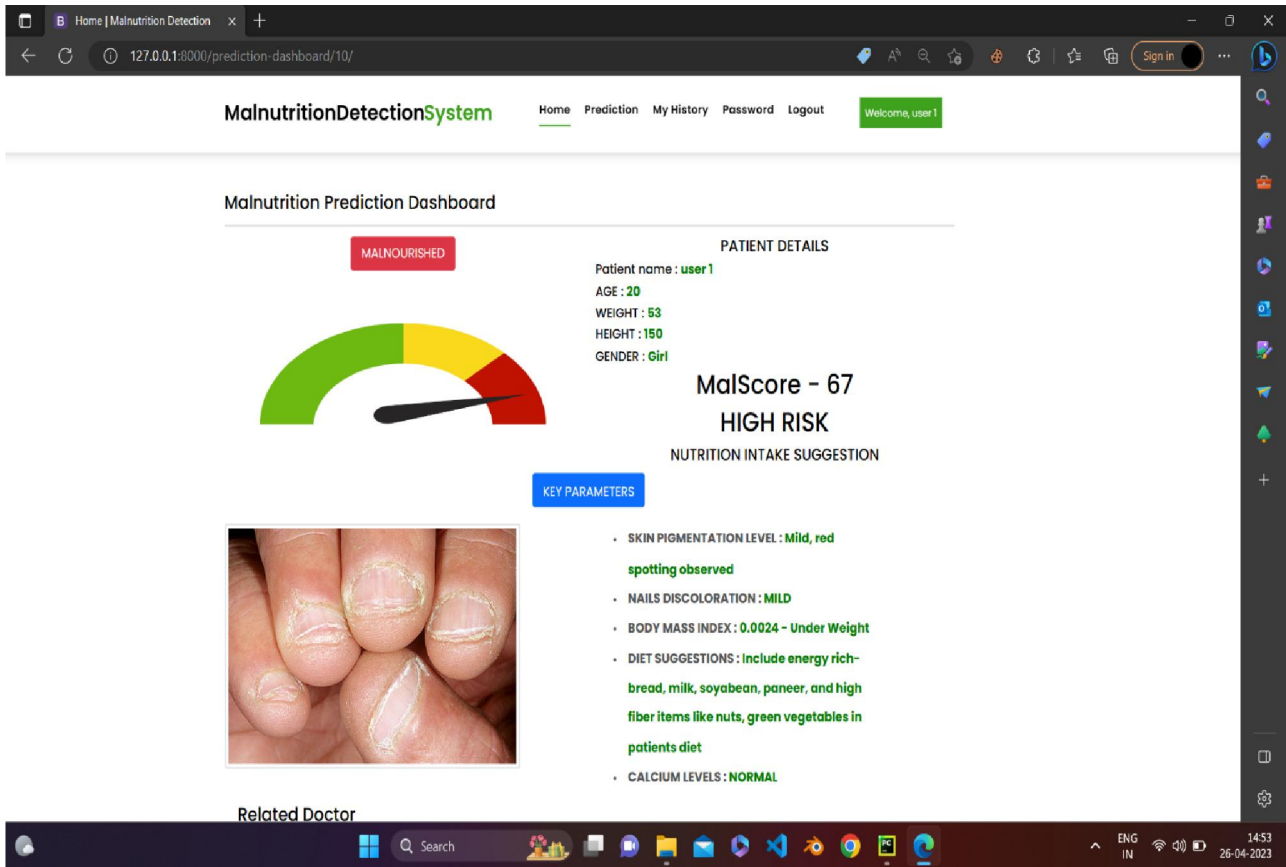
**MalScore - 32**  
**LOW RISK**  
 NUTRITION INTAKE SUGGESTION

**KEY PARAMETERS**

- SKIN PIGMENTATION LEVEL : LOW
- NAILS DISCOLORATION : MILD
- BODY MASS INDEX : 0.0025 - Healthy Weight
- DIET SUGGESTIONS : Include fruits, and high fibers items like nuts, green vegetables in patients diet
- CALCIUM LEVELS : NORMAL

MalnutritionDetection The Company International sites





## VII. CONCLUSION

The development of a web application for the detection of malnutrition using deep learning and neural network models can provide a powerful tool for medical professionals to detect and prevent malnutrition early. The application can help to improve the accuracy and efficiency of malnutrition detection, reducing the risk of complications and improving patient outcomes.

The use of deep learning and neural network models such as CNNs and random forest algorithms can improve the accuracy of malnutrition detection by analyzing large amounts of medical data and identifying important features related to malnutrition. These models can be trained on various features such as anthropometric measurements, dietary habits, and medical history, and can provide accurate predictions for users based on their input data.

The integration of these models with the Django web framework can provide a user-friendly and accessible interface for medical professionals to input patient data and receive accurate malnutrition predictions.

The application can also provide additional features such as data visualization and patient monitoring, allowing medical professionals to track patient progress and make informed decisions about treatment options.

In conclusion, the development of a web application for the detection of malnutrition using deep learning and neural network models can provide a powerful tool for medical professionals to improve the accuracy and efficiency of malnutrition detection and prevent its complications. With further development and refinement, such applications have the potential to make a significant impact on public health and improve patient outcomes.

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