

Malnutrition Detection using Deep Learning and Machine Learning



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ABSTRACT

In this paper we are elaborating the concept of disease detection of the human body using nail image and textual data of human fingers and analyzing data from the image of basic nail color. In this paper the procedure of disease detection can be explained with input to the system is a person's nail image and textual data. The system will process an image of nail and extract features of nail which is used for disease diagnosis. Here, first training data is prepared using Machine Learning from a nail image of a patient of specific disease. A feature extracted from input nail image and textual data is compared with training data set. We found that the color feature of nail image and textual data are correctly matched with training set data. We also expand this system to analyze the particular area to ensure maximum patient will health is weak based on hospital patient data with the help of clustering. It is implemented as a desktop application in which the user submits heterogeneous data like text and image of skin and nails images along with textual data. It retrieves hidden data from a stored database and deep learning model and compares the user values with a trained data set.

Keywords: Machine Learning, Malnutrition, Disease Detection.

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I. INTRODUCTION

Malnutrition is a complex topic that draws the attention of the world and many researchers. Nutrition is vital for health at all ages. The Health and nutritional status of children is one of the benchmarks that can indicate the nutritional condition of the wider community, because the pattern of parenting in many communities prioritizes the toddler. Malnutrition does not occur suddenly, but begins with insufficient weight gain. Changes in toddler weight within a certain time are an early indication of child nutritional circumstances. In the six-month period, infants who did not gain weight 2 times, were at risk of malnutrition 12.6 times than those with regular weight gain. Based on this, the weight change information can be the parameter to mapping the potential malnutrition problems.

Thus, information of areas with potential malnutrition is needed as input for government and public policy makers to prevent malnutrition and make nutritional intervention.

The desired paper is characterized with these processes, viz., The problem statement and existing system in Section 2; System motivation is presented in Section 3; literature survey in Section 4; Proposed model in Section 5; and concludes the paper.

II. PROBLEM STATEMENT

Malnutrition is one of the largest public health problems in developing countries. India contributes 1/3rd of total malnourished children in the world, with prevalence as high as 29.4%.

The purpose of this study was to assess the association of malnutrition with scholastic performance among 8–12 year children data to analyze the health records. This cross sectional study was done among 8–12 year children, with sample children photos with text input data, taking the prevalence as 50%, precision as 10%.

III. MOTIVATION AND OBJECTIVE

Motivation:

Our main motivation is to find the solution over and it. Where, our system will show the dashboard representation where we can see all the variation in increasing and decreasing order.

Detection of malnourished people is the main task of our system.

The proposed scheme should be efficient and the system will be scalable. Through this research it is highlighted that e-government initiative has been expanded to some extent, there are lack of health related projects.

Objectives:

The main objective of this system is to detect malnutrition without a doctor as an early stage and treatment is taken.

To minimize the malnutrition's children ratio before different health issues.

To reduce the manual process and automation implemented with accurate result

IV. LITERATURE SURVEY

Ziaullah Momand, Pornchai Mongkolnam, Pichai Kositpanthavong, Jonathan H. Chan, "Data Mining Based Prediction of Malnutrition in Afghan Children", 2020, [1] The primary target of this phenomenon is children under five years of age and mostly for developing countries. In this paper, a data mining approach is proposed to predict the malnutrition status of children under five years of age in Afghanistan. Random Forest, PART rule induction, and Naïve Bayes classifiers were applied to Afghanistan Nutrition SMART Survey data. The results were compared with the Logistic Regression statistical method. Random Forest and PART rule induction classifiers performed well with the highest accuracy for stunted, underweight, wasted, and nutritional oedema statuses with and without transformed attributes. This paper defines how data mining classification techniques can classify malnutrition status for children under five years of age. Generally, our method was the one that obtained the most robust results to predict the malnutrition status based on clinical sign and anthropometric parameters of preschool-age Afghan children.

Nair Akash Anilkumar¹, Deepa Gupta², Sangita Khare¹, Deepika Manippady Gopalkrishna³, Amalendu Jyotishi³ "Characteristics and Causes of Malnutrition across Indian States: A Cluster Analysis Based on Indian Demographic and Health Survey Data", 2017, [2] Undernutrition is the root cause of death of over 3.5 million children under the age of five in India. To address this issue of malnutrition, though overarching national policy is desirable, it may not be effective if the root cause of malnutrition varies across regions of the country. In this paper, the attempt made in this paper is two-fold. First, the Indian States can be clustered on four anthropometric parameters of malnutrition. Second, whether the clusters formed thus, exhibit different explaining factors for malnutrition. The Indian-DHS (Demographic Health Survey) Data is used for the analysis. The results thus arrived would help policy-makers to have a targeted approach to malnutrition in different clusters of states.

Cynthia Hayat, Barens Abian, "The Modeling of Artificial Neural Network of Early Diagnosis for Malnutrition with Backpropagation Method", 2018, [3] The negative effects of malnutrition can be minimized by developing medical technology through combining expert experience and knowledge to produce an early diagnosis. The development of ANN architectural model is conducted to identify the types of malnutrition. This paper consisted of 2 phases, which were a training phase in which it generated ANN weight by using feed-forward of activation function, and testing phase in which the result of the previous stage was tested to obtain output.

Sri Winiarti, Sri Kusumadewi, Izzati Muhimmah, Herman Yuliansyah, "Determining The Nutrition of Patient Based on Food Packaging Product Using Fuzzy C Means Algorithm", 2017, [4] In this paper is the utilization of Fuzzy C Means (FCM) method as the determination of patient's nutritional status, which is implemented, in mobile application. Parameters used to cluster nutritional status are height, weight and age. The result of the decision will give 3 clusters of nutritional status is good nutrition, malnutrition and better nutrition. Mobile apps are used as a reminder of the nutritional value or ingredients contained in the packaging of food products while consuming food. The result of system testing for application of FCM algorithm in this mobile application obtained validation of 80%.

V. PROPOSED SYSTEM

The main application of this system is to the government to minimize malnutrition percentage. In this block diagram we are considering 5 stages-

1. Upload Medical data-

The first thing we required is a dataset. In this stage we have to upload Medical data such as textual data i.e., name ,age ,address, gender etc. that all are information of malnutrition people.

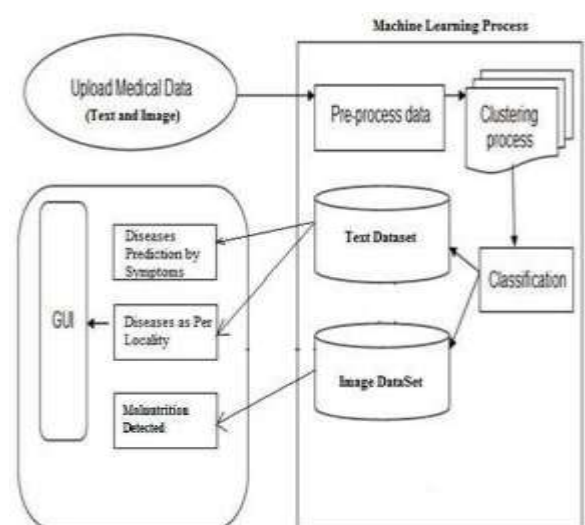


Fig 1. Block diagram

2. Pre-process data-

Data pre-processing is a way of converting data from the raw form to a much more usable or desired form. Under this

stage we have to perform data cleansing, Replacing missing value, Handling Outlines on Images Dataset.

3. Clustering process-

Clustering is the task of dividing the data points into a number of groups such that data points in the same groups are more similar to other data points in the same group and dissimilar to the data points in other groups. It is basically a collection of objects on the basis of similarity and dissimilarity between them. In this stage we have performed clustering on a malnutrition dataset using CNN algorithm.

4. Classification-

Classification is a process of categorizing a given set of data into classes, It can be performed on both structured or unstructured data. The process starts with predicting the class of given data points. The classes are often referred to as target, label or categories. In this stage we have to classify people on their malnutrition status.

5. GUI-

Then in this last stage, provide output to the user. For example, if this person is malnourished or not.

In this proposed system we are considering three modules-

1. Patient module:

Patients will be able to sign up or login. For successful login username and password will be needed. Patient will upload malnutrition images and textual data in this module by patient to check the diseases. Here patients will get the information about self health in which the condition is critical or not menace disease without any doctor suggestion.

2. Admin module:

In the admin module, train the image dataset based on a medical related backend for analysis and comparison of upcoming patient images. Admin also analyzes the text data of patients.

3. Processing module:

Once get the image and textual data as an input from the patient then the proposed algorithm applies the detection process on that image to find out the malnutrition patient or not in percentage.

VI. CONCLUSION

In the present system, the system analyzes the human nail and gives probable disease for a person including a healthy case. Here, for disease prediction nail color (average RGB) value used as a nail feature. This model gives more accurate results than the human eye like subjectivity and resolution power. This may give more accurate results for identifying human health conditions using machine learning algorithms.

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