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Image Processing based Malnutrition Analysis with Help of Data Science Technique

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ABSTRACT

In this paper we are elaborating concept of disease detection of human body using nail image of human fingers and analyzing data from the image of basic of nail color. In this project the procedure of disease detection is as follows: The input to the system is a person nail image. The system will process an image of nail and extract feature of nail which is used for disease diagnosis. Here, first training data is prepared using Machine Learning from nail image of patient of specific disease. A feature extracted from input nail image is compared with training data set. In this project we found that color feature of nail image is correctly matched with training set data.

Keywords: Machine Learning, Malnutrition, Disease Detection, PyQt, Deep Learning.

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I. INTRODUCTION

In most cases, people's homes, preventing starvation is achievable with ready-to-to-use therapeutic diets. Extreme undernutrition should be treated in a hospital facility, if possible. Treatment usually includes maintaining low blood sugar and the body's moisture, treating dehydration, and closely monitoring caloric intake. Antibiotics should be given as a course treatment due to the increased risk of infection. Time-worn steps include: doing more about farming activities, alleviating hunger, and reducing the spread of disease.

The medical term for malnourishment is both deficits and excesses of calories, or imbalances of basic nutrients, respectively. both diet-related morbidity-related disorders, twice the burden of malnutrition The four manifestations of malnutrition include wasted weight, retarded development, size gains, and low weight for height, under nutrition, and micronutrient deficiency. “For many, the term “ malnutrition” seems to conjure up a picture of a thin third-world kid with a distended stomach and muscular arms” This picture alone, however, does not provide a realistic impression of starvation. Additionally, someone who is 150 pounds overweight is not only at risk of health problems but is also at risk of undernourishment.

National Nutrition Mission

1. The government had introduced a new National Nutrition Scheme in March of the year 2018.

2. 3% under per annum.

3. It also wants to total the percentage of stunted children in the population by 2% by the year 2022, thereby lowering the number to 25%.

4. It attempts to draw up different schemes dealing with malnutrition and put in place a convergence process, and a real-time surveillance framework, besides offering incentives to states and territories for their participation.

5. A national nutrition strategy is supported by the NIT Aay group with the goal of eliminating all malnutrition by the year 2022.

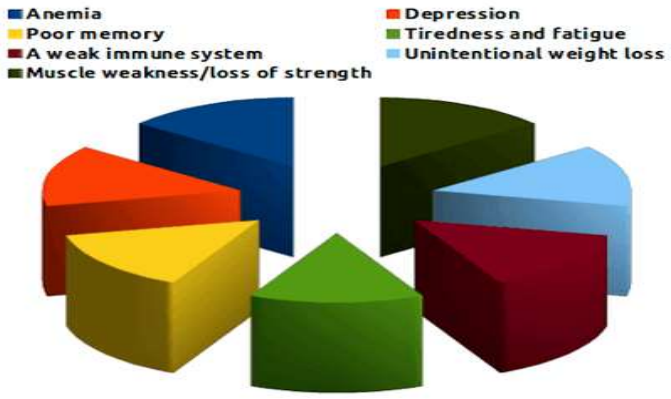

Fig 1. Malnutrition In Senior

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 analysis 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. LITERATURE SURVEY

[1] Cynthia Hayat,Barens Abian, "The Modeling of Artificial Neural Network of Early Diagnosis for Malnutrition with Backpropagation Method", 2018, this research consisted of 2 phases, which were 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.

[2] Bambang Lareno, Liliana Swastina, Husnul Maad Junaidi, "IT Application to Mapping The Potential of Malnutrition Problems", 2018, this paper focus to find a model of IT application that can be used for mapping the potential of malnutrition problems and the rate of utilization of posyandu. The result, the cross-platform information model developed is a web-based core system, with a mobile application-based support system.

[3] Anutosh Maitra, Rambhau Eknath Rote, Nataraj Kuntagod, "Managing Child Malnutrition via Digital Enablement: Insights from a Field Trial", 2017, in this paper that malnutrition management requires an integrated digital approach – that not only looks at making data available, but also establishing relationships between various program indicators, overlaying that with socio-economic conditions of the region and family demographics.

[4] Sri Winiarti, Sri Kusumadewi, Izzati Muhimmah, Herman Yuliansyah, "Determining The Nutrition of Patient Based on Food Packaging Product Using Fuzzy C Means Algorithm", 2017, the result of the decision will give 3 clusters on 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%.

[5] Archana Ajith, Vrinda Goel, "Digital Dermatology Skin Disease Detection Model using Image Processing", 2017, This paper proposes a skin disease detection method based on image processing techniques. This method is mobile based and hence very accessible even in remote areas and it is completely noninvasive to patient's skin. The patient provides an image of the infected area of the skin as an input to the prototype.

[6] Kyamelia Roy, Sheli Sinha Chaudhuri, "Skin Disease detection based on different Segmentation Techniques", 2019, The outer integument of the human body is skin. The skin pigmentation of human beings varies from person to person and human skin type can be dry, oily, or combination. Such a variety in the human skin provides a diversified habitat for bacteria and other microorganisms. Melanocytes in the human skin, produces melanin which can absorb harmful ultraviolet radiation from sunlight which can damage the skin and result in skin cancer.

[7] Sambit BAKHSHI, "Deep convolutional neural network for face skin diseases identification", 2019, In this paper, author propose an automated facial skin disease method using a pre-trained deep convolutional neural network (CNN). In the beginning, the images are regenerated using some pre-processing image techniques in order to augment the size of our database, collected from different sources and resized to fit the network. These images are then used for training and validation purposes.

[8] Tanzina Afroz Rimi, "Derm-NN: Skin Diseases Detection Using Convolutional Neural Network", 2020, This paper is a sandwich between picture handling strategies and machine learning. Where picture preparation has produced the picture which is being utilized by CNN to arrange the classes. The preparation information comprises five classes of the skin gives that have been talked about above. We have 73% precision by actualizing our framework on the dermnet dataset of 500 pictures of various diseases. This will end up being an incredible achievement if the further enhancements are finished utilizing a bigger measure of the dataset.

[9] Shih-Hsiung Lee, Chu-Sing Yang, "An Image Preprocessing Method for Fingernail Segmentation in Microscopy Image", 2019, this paper proposes an image preprocessing method, trying to segment different parts of nail: lunula and nail plate. In the data of poor image quality, the lunula may not be presented clearly. In order to maintain the nail image quality, this paper uses microscope to capture nail image. Besides lunula and nail plate, the nail details, such as free edge, cross striation and longitudinal striation, can be seen clearly in the image captured by microscope.

[10] Laura Safira, Budhi Irawan, Casi Setianingsih, K-Nearest Neighbour Classification and Feature Extraction GLCM for Identification of Terry's Nail, 2019, The dataset in this study is taken from Google and also some of the paper that discusses the nail abnormalities. Nail pictures obtained are different from any source. Therefore, the image

should be cut just one finger. Because when detecting terry's nail, the disorder usually occurs in all the nails. So we can use one finger. The photos of a nail that has been doing the extraction characteristics using GLCM then will be done using KNN classification. In this case the class will be divided into two classes, healthy and Terry's.

[11] Hongfeng Li a, Yini Pan b , Jie Zhao c , Li Zhang d, "Skin disease diagnosis with deep learning: A review", 2021, In this paper, author present a review on deep learning methods and their applications in skin disease diagnosis. We first present a brief introduction to skin diseases and image acquisition methods in dermatology, and list several publicly available skin datasets. Then, we introduce the conception of deep learning, and review popular deep learning architectures and popular frameworks facilitating the implementation of deep learning algorithms.

IV. PROPOSED METHODOLOGY

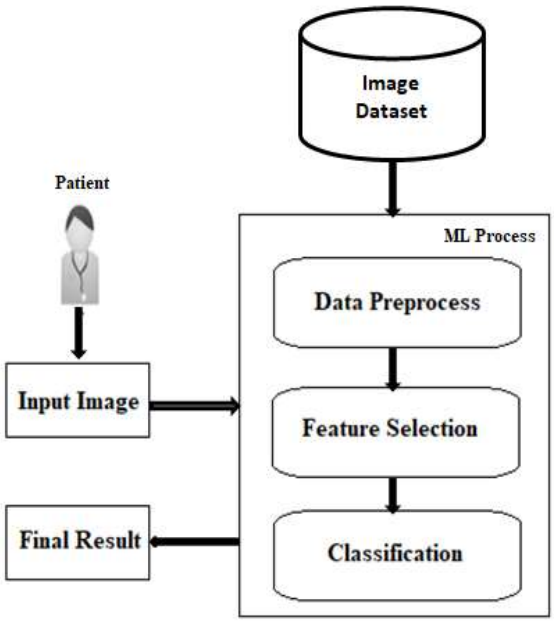

Fig 2. System architecture

A. *Description*:

The main application of this system is to government to minimize malnutrition percentage.

Patient module:
Upload malnutrition image in this module by patient to check the diseases. Here patient will get the Patient health is critical or not menace disease without any doctor suggestion.

CNN Training module:
Here admin train the image dataset based on medical related backend for analysis and comparison of upcoming patient images.

Processing module:
Once get the image from patient then proposed algorithm apply the detection process on that image to find out the malnutrition patient or not.

B. *Algorithm*

The four important layers in CNN are:

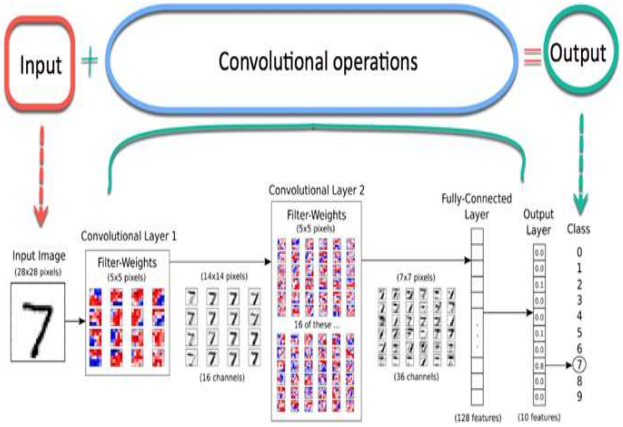

Fig 3: Architecture of CNN

1. Convolution Layer

The first move in removing valuable material from a photograph is to take a look at it. Several filters in a convolution layer conduct the convolution process. Every image is interpreted as a matrix of pixel values.

2. ReLU layer

The abbreviation ReLU stands for rectified linear unit. After removing the feature charts, they must be shifted to a ReLU sheet. ReLU goes through each factor one by one, converting all negative pixels to zero. The network becomes nonlinear as a consequence, and the result is a rectified function map.

3. Pooling Layer

Pooling is a downsampling technique that reduces the dimensionality of a feature map. The rectified feature map is now moved into a pooling layer to build a pooled feature map. The pooling layer uses a series of filters to recognise points, corners, the body, feathers, pupils, and the beak, among other things.

4. Fully Connected Layer

To classify the image, the flattened matrix is fed as an input to the fully connected layer. The flattened feature map is then moved into a neural network after flattening. The input layer, completely linked layer, and output layer make up this level. In ANNs, the fully related layer is identical to the secret layer, but it is completely associated. The predicted groups are stored in the output layer.

C. *Result and Discussion*

The improved findings obtained in detecting and avoiding dermatological diseases utilising Deep Learning Neural Networks (CNN) and Residual Neural Networks (ResNet) strategies give greater precision than other neural networks.

V. CONCLUSION

The machine analyses a person's nail and decides whether or not they have an illness, even though they are well, according to the proposed scheme. The average RGB value of the nail is used as a nail function for disease prediction. This model is more realistic than the human eye in terms of subjectivity and resolving power. When

utilising a machine learning method to identify human health problems, this will produce a more accurate outcome.

To predict disease, this project will use an abstract colour feature of a human nail picture. The framework is based on human nail colour analysis and relies on image recognition. The fitness of an individual may be determined by looking at their nails. A camera in this system is used to get an image of a human nail.

VI. FUTURE SCOPE

- Any patient may use this approach to analyse the Illness and identify particular disease patients since the proposed system's scope is well-known in the medical community.
- To enlist the government's assistance in doing patient-centred health studies.
- To correctly forecast a patient's disease using the diagnostic camp.
- This system's functionality will expand as more implementations are used, and it will be expanded with new algorithms and input parameter types from other enhance systems in the future.

VII.REFERENCES

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[2] Bambang Lareno, Liliana Swastina, Husnul Maad Junaidi, "IT Application to Mapping The Potential of Malnutrition Problems, 2018.

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[10] Laura Safira, Budhi Irawan, Casi Setianingsih, K-Nearest Neighbour Classification and Feature Extraction GLCM for Identification of Terry's Nail, 2019.

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