Dental Based Neurological Disorders Prediction Using Deep Learning Techniques

N.Valarmathi[a], Mr.M.Gopitharan[b], V.Kesavan[c] , P.Muthu Mahesh[d], and M.Yuvarajan[e]

a,b,c,d,e
Department Of Information Technology
 M.Kumarasamy College of Engineering, Karur, Tamilnadu, India

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Abstract: Dental diseases based on neurological disorders arises as people gets older. It may also cause tooth decay and losing of tooth. People with poor oral health can also experience this kind of diseases. So we are developing a tool where we can predict the diseases and can take the necessary steps in the early stage. It is important for one to keep their dental a perfect one. Once they loss it their confidence automatically gets decreased. Hence by developing this people can get rid of the problems and can also avoid dental based neurological problems. Since the development of technology is in rapid speed it is necessary to upgrade our current technologies with some advanced features. In this project we will be collecting the images of the dental and feed it as the input. From that the feature values will be collected and classify them into the diseases. It uses Convolutional Neural Network (CNN) algorithm where the diseases can be classified using this algorithm. The development of this project can help people to find the diseases just by scanning their dental part. It makes the prediction to be a simple process so that the dentist itself can use this and find the disorders. From this project we can conclude that it is simple that a neurological disorder that is caused by dental can be predicted easily and hence preventing them.

Keywords: Convolutional Neural Network Algorithm, Neurological Disorder.

1. Introduction

Oral health care is a necessary on that each and everyone should look after. The dental based diseases may cause tooth decay and much more problems. It can also cause some damage to brain since some part of the dental nerves are connected to the brain. It should be avoided to make sure that the diseases cannot be occurred. Our main aim is to find the diseases based on the feature points from the dental images that we give as the input. The main problems caused by the dental based neurological diseases can be categorized into Alzheimer's disease, brain tumor. Tooth loss can also affect nerves and brainstem region. So we are bring an idea for minimizing the diseases caused by the dental and also preventing the dental related problems. It is necessary to get a regular checkup for dental care. People should be aware of the diseases that can be caused by dental problems. People should take care of their own health first. The dental problems are caused by people not being aware of how it will occur. So by using our project we can detect the diseases caused by dental and dental based neurological diseases.
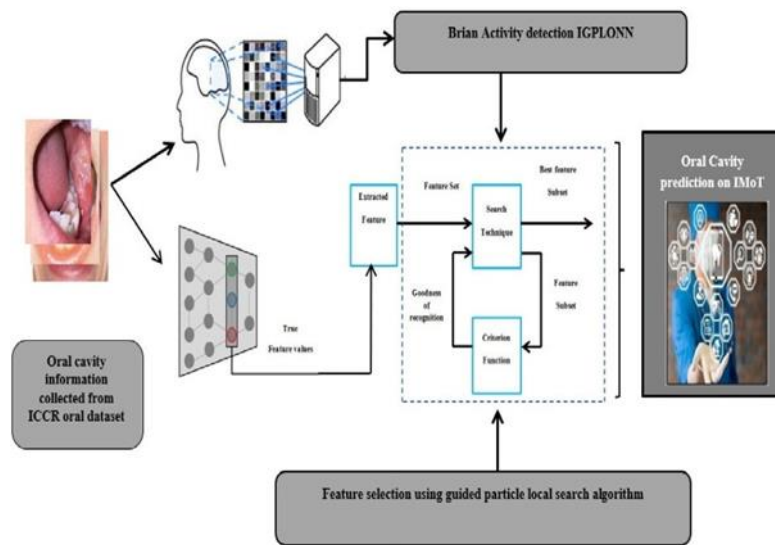
2. Literature Review

Several kinds of research and techniques have been proposed to identify the dental based neurological diseases. A lot of research is performed on prediction process which uses many mechanisms. There are medical sensors on general computing system which can be used to process the wearable IOT assisted medical sensors. This method is done by H.Fouad who does this computing framework to improve processing request. He proposed DSCF with IOT that improves bandwidth, utilization of storage and minimizing the failure. Whereas according to Gunasekaran Manogaran wearable IOT device with deep learning network system can perform physical monitoring and can be very useful for upcoming generation technologies. It provides quality healthcare data to support the healthcare for the patients. Meanwhile P.Gomathi and S.Baskar gives an idea based on electroencephalogram using evolutionary gravitational neural network for finding the birth defects, brain strokes, brain injuries, etc. Here they use GNNN for recognizing the diseases in effective manner.

3. Existing System

Diseases caused in the oral is very important for our entire health. This can be seen by studies by various health organization which says that oral infections are the main reasons in causing torment, distress, periodontal disease, oral cancer, oral manifestations of HIV infection, Noma, teeth misfortune and indeed few death cases also. It is one of the common dental illness that occurs in world, which is in maximum count as an individuals. Periodontal infections are too the eleventh most common happening illness throughout the world. At the same time, oral cancer is one of the most predominant cancer happening in some countries as it comes within the three most common cancers. Hence these diseases are commonly happening worldwide nowadays. Tooth decay may be a complicated malady within the tooth, which results disintegration finish annihilation natural teeth. Lowering the pH, standard utilization of surgery eat less, or diminished salivary emissions in oral depth, times, which passes streptococci that can cause damage to the teeth. It is a fiery illness that caries many components that causes the disease. In the existing framework actualize the system to recognize the verbal related infections utilizing machine learning methods.
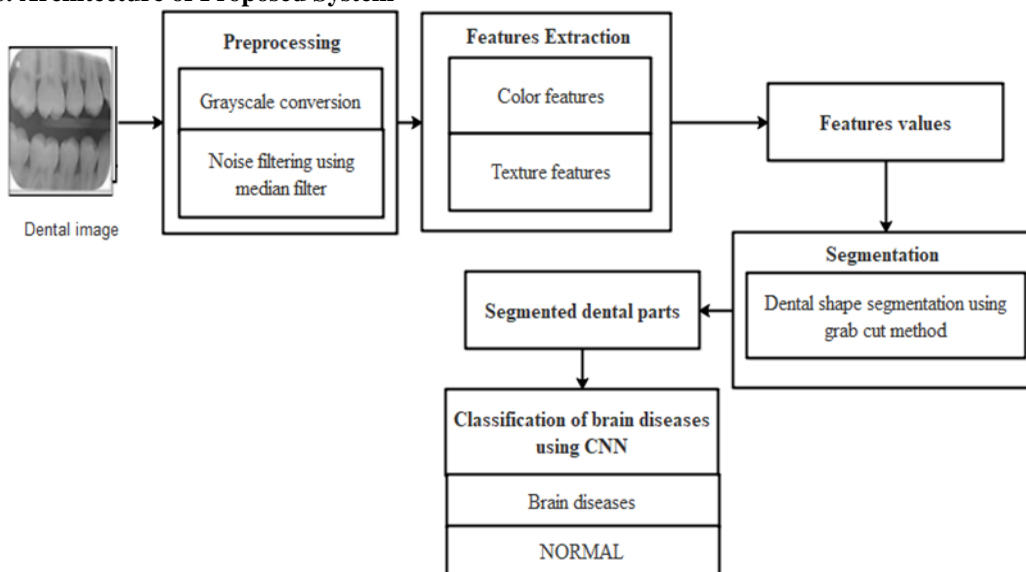
4. Architecture of Existing System

5. Proposed System

The computerized change in dentistry, on the basis of electronic healthcare information data, can be considered as one of the major cause of the 21st century dentistry which can handle immediate, future challenges related to dental healthcare. The supposition centers examines best patterns and advancements of the modern computerized time, with potential to unequivocally impact the heading of dental investigate. Advanced change is the omnipresent catchword in an assortment of trade divisions, and (dental) medication is no special case. The progress that is happening in the information technology (IT) have made it to overcome obstacles that hampered in bot experimental and technological work only few years ago. The execution of advanced apparatuses and applications yields novel choices confronting present main issues in health, such as statistic advancement in a maturing populace with the expanded predominance of unremitting maladies and expanded treatment which costs in the individual's life expectancy. In oral pharmaceutical, a few computerized workflows for generation handling have as of now been coordinates into treatment conventions, particularly within the quickly developing department of computer-aided designing or computer-aided fabricating (CAM/ CAD), fast prototyping. By the use of Artificial Intelligence (AI) and Deep Learning (DL), new possibilities have been opened for automating radiological imaging. In this proposed system, implement grab cut method to predict the dental features and also classify the diseases using Convolutional neural network (CNN) algorithm.

6. Architecture of Proposed System

7. Modules

1. Image Acquisition
2. Preprocessing
3. Features Extraction
4. Classification

5. Disease Prediction

7.1 Image Acquisition

Automated dental identification system (ADIS) was introduced to extract distinctive features on images of teeth. They were then compared to each other automatically to find best candidates in the database for identifying the unknown person. Classify the image, teeth segmentation, extracted the feature value and pattern matching are the main process of the system. Neurobiological and human brain imaging research has greatly advanced our understanding the brain mechanisms that govern perceptual and memory function, as well as their role in daily activities. In this module we can input the oral dataset image. Image data can be any size and any type.

7.2 Preprocessing

Pre-processing is a term used to describe operations with images at the lowest level of abstraction where the input and output images are intensity images. In this module, convert the RGB images into gray scale images. And implement median filtering algorithm to remove the noises in images. The median filter is a nonlinear digital filtering technique which is used to remove noise from an image or signal. Such noise reduction may be an ordinary pre-processing step to move forward the comes about of afterward handling (for illustration, edge location on a picture). The median value of each pixel in the window is calculate and sorting the pixel values into numerical order. After that, the pixel being considered is replaced by the middle(median) pixel value.

7.3 Features Extraction

Feature extraction involves simplifying the number of resources required to describe a large amount of dataset accurately. In this module implement color and texture features are implemented using Grab cut method. Based on these features, dental parts are segmented.

7.4 Classification

The final stage is classification of the system. After analyzing the structure of the system, each section is evaluated individually for its probability to lead to true positives. Brain diseases are classified using the Convolutional neural network algorithm. CNNs speak to feed-forward neural systems which encompass different combination of the convolutional layers, max pooling layers, and totally related layers and it takes advantages of spatial neighborhood relationship by forcing an adjacent network design among neurons of adjacent layers.

7.5 Disease Prediction

Brain functional imaging data, particularly useful attractive reverberation imaging information, have been utilized to reflect utilitarian integration of the brain. Change in brain useful network is anticipated to supply potential biomarkers for classifying or anticipating brain disorder. In this module, able to classify the brain diseases based on extracted features. Based on extracted features such as Alzheimer's disease, Epilepsy, Seizure Disorder.

8. Conclusion

Several studies have examined the potential usefulness and accuracy of artificial intelligence approaches to medical image analysis, such as clinical photos, X-rays, Computed Tomography (CT), attractive reverberation imaging, and positron outflow tomography filters. Specifically, the deep CNN algorithm has been utilized most and has yielded promising results. Thus, in this ponder, directed profound learning with a pre-labeled periapical radiographic dataset was performed on a CNN calculation. We too stated as true that the comes about had comparative demonstrative and prescient exactness to those obtained by board-certified periodontists. In future, we can extend the framework to implement various deep learning techniques to improve the accuracy rate in disease prediction. And also identify the various brain diseases based on dental images.

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