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Multi Disease Detection Using Deep Learning

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ABSTRACT

Breast cancer is the most common type of cancer among Indian women. One in every two Indian women diagnosed with breast cancer dies, resulting in a fifty percent likelihood of death. The goal of this work is to compare three widely used machine learning algorithms and methodologies for breast cancer prediction: Random Forest, kNN (k-Nearest-Neighbor), and Nave Bayes. The Wisconsin Diagnosis Breast Cancer data set was used as a training set to examine the performance of several machine learning approaches in terms of accuracy and precision. Iris melanocytic tumours, often known as eye tumours, are the most dangerous tumours in the eye. Freckle, nevus, melanocytoma, Lisch nodule, and melanoma are all examples of this. Early detection of an eye tumour is quite challenging. Many studies are being conducted to detect eye problems. However, just a few studies on ocular tumours have been published. To capture the region, the majority of the system requires specific data gathering equipment. This is quite costly. Doctors recommend PET - CT, eye ultrasound, angiography, optical coherence tomography, and other tests to diagnose eye melanoma. Using a deep learning technique, a new method for detecting eye tumours from eye pictures is given. Though current medical imaging science is advancing at a breakneck pace, pinpointing a brain tumour remains a difficult endeavour. Unlike other imaging systems, medical imaging has the largest penalty for a minor inaccuracy.

To reduce the risk of inaccuracy, tumour detection should be precise. Previous studies relied on biopsy to distinguish tumour tissue from other soft tissues in the brain, which is time-consuming and prone to error. Melanoma is the most lethal type of skin cancer in the globe.

Many efforts have been made to use deep learning to detect melanoma early using dermoscopic pictures. For a correct diagnosis of melanoma, it is critical to identify certain lesion patterns. The prevalent lesion patterns, on the other hand, are not always present, resulting in sparse labelling issues in the data. We present a multi-task U-Net model to detect melanoma lesion properties automatically in this work.

KEYWORDS – multi disease detection, pre-processing, classifier algorithm, feature extraction, Convolutional neural network (CNN) etc.

INTRODUCTIONS

It is a medical approach for detecting breast cancer in women that has no adverse effects, making it a safe operation. Women who receive mammograms on a regular basis have a higher survival percentage than women who don't. Women account for about 15% of all cancer-related deaths. The odds of developing this sort of cancer are usually higher in metropolitan areas, although the rate of contracting appears to be on an upward growing trend worldwide. Early detection and screening are now the only ways to improve the outcomes of breast cancer cases. Iris melanocytic tumours, sometimes known as "eye tumours," are the most dangerous tumours in the eye.

Freckle, nevus, melanocytoma, Lisch nodule, and melanoma are all examples of this [1]. The term ocular is used to describe a tumour that is accompanied with an eye. It can be intraocular (affecting the interior of the eye) or extraocular (affecting the exterior of the eye). A brain tumour is a mass or growth of various tissues in the brain or in surrounding tissues such as the meninges, pituitary glands, pineal gland, skull, and neurons.

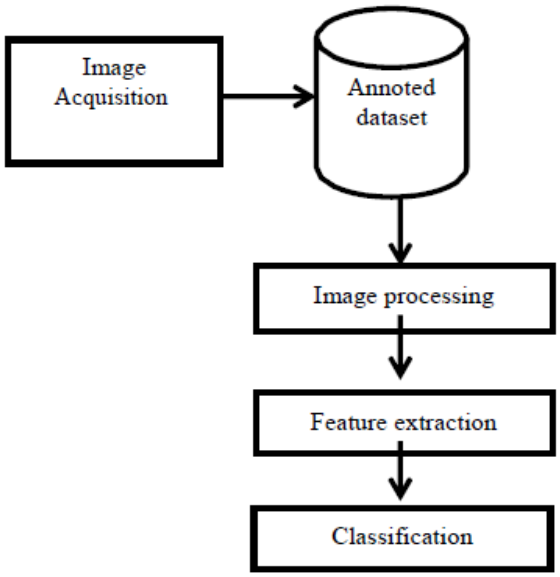
There are many distinct types of brain tumours. Some are cancerous and are referred to as malignant, while others are noncancerous and are referred to as benign. Gliomas are the most frequent and lethal type of brain tumour, with glioblastoma being a subtype that ranges from slow-growing low-graded tumours to high-graded malignant tumours. Melanoma in its advanced stages can spread to other parts of the body, making it difficult to treat and often fatal. Melanoma, on the other hand, can be treated and cured in its early stages. There have been numerous attempts to identify melanoma at an early stage. Dermoscopy is a noninvasive procedure for examining pigmented skin lesions that is extensively used in skin cancer screening. It can produce high-resolution images of the skin's lesion regions. The dermatologist must still examine the photos based on multiple skin lesion patterns to identify melanoma.

OBJECTIVE:

The main objective of this paper is to detect the multi disease affected portion of and healthy portion of body To detect unhealthy region of body part. Classification of dataset using texture features. Coding is used to analyze the multi disease infection

GENERAL PLANT DISEASE DETECTION SYSTEM :

n a proposed system, we are proposing experiment on chronic diseases like lung cancer, brain tumor, heart
disease and breast cancer with limited set of supervised data.



Multi disease detection system

We propose a new multimodal illness risk prediction model based on Convolutional neural networks that is more accurate for limiting chronic diseases. With accurate stage forecasts, we will be able to tackle the issue of accuracy in lung cancer diagnosis. We also concentrate on detecting brain malignancies using machine evaluations based on tumour sizes in millimetres. The detection of heart illness is based on a diagnosed dataset, such as heart symptoms reports. Lung cancer detection, heart disease detection, and brain tumour detection are the three key modules of the proposed system. Our system has two modules: admin and users. Admin begins by gathering information about various ailments in the form of text and photographs.

Data Analyses

The content of this paper deals with a systematic review, not in a meta-analysis of the state of the art related to the intelligent data analysis in the medical field. Nevertheless, it does not deepen into the details regarded

to the results obtained in each case of study. Hence, data analysis techniques are not applicable in this case.

EXISTING SYSTEM APPROACH

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Pathological tests, such as needle biopsy specimens and analysis by experienced pathologists, are required for reliable identification and classification of chronic diseases. Because this involves human judgement of several factors and a combination of experiences, a decision support system is desirable in this case. The rate of saving patients' lives after diagnosis by manual judgments is not very high. The methodologies used in previous research are unable to provide Nobel solutions for chronic diseases, and their accuracy is inadequate. Algorithm based on hospital data, both organised and unstructured. To our knowledge, no existing work in the field of medical big data analytics has focused on both data types. Reducing the number of people who die as a result of a misdiagnosis by providing accurate diagnoses We've gone through the process of combining CT and MRI examinations. This strategy improves the information's quality. As a result, we are able to select the appropriate step.

.RELATED WORK OR LITERATURE SURVEY

[1] proposed When an inflamed winding path gets out of hand, it causes heart disease. Heart illnesses are complicated, and they claim a large number of lives each year. When the early symptoms of heart disease are ignored, the patient may have unusual consequences in a short period of time. In our day and age, the situation has been compounded by a stationary way of life and excessive concern. It is possible to monitor

diseases if they are identified early. Regardless, it's always a good idea to practise every day and get rid of bad habits as soon as possible. Tobacco use and its negative consequences Weight loss programmes increase the risk of stroke and heart disease. It is a good idea to consume at least 5 helpings of soil products every day. Patients with coronary artery disease should limit their salt intake to one teaspoon per day.

[2] proposed Because there are no tests to acquire familiar with a precise mapping between highlights and class marks, characterising lung illness using a limited population, high dimensional dataset is difficult. This job is frequently handled in modern writing by high-quality component production and determination. Deep learning has recently been discovered to have the ability to recognise the essential structure of information utilising auto encoders and other techniques. A profound auto encoder grouping system is proposed in this paper, which first adapts profound highlights and then creates a fake neural system using these educated highlights. When prepared with all properties and the identical preparatory tests, the profound educated classifier outflanks every other classifier, according to exploratory results.

[3] introducing Because of the inconstancy of tumour morphologies and the difficulty of determining the tumour area, size, and surface in magnetic resonance imaging (MRI), mind tumour division is regarded as a complicated methodology. The division of brain tumours is a time-consuming task that is prone to human error. As a result, this study provides a mechanised technique for detecting tumour cuts in volumetric MRI mind filters and segmenting the tumour overall picture cuts. Initially, many calculations are used in the pre-planning step to clean and institutionalise the obtained data. Highlight extraction and choice are performed using an altered dim level co-event lattice and Analysis of Variance (ANOVA).

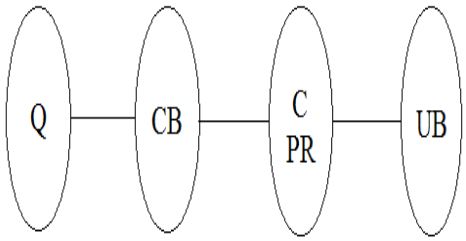
[4] states The Naive Bayesian Characterization technique was used to construct the Choice Support in Heart Disease Prediction Framework. The framework distinguishes hidden learning from a real-world database of coronary artery disease. This is the most accurate model for predicting patients with coronary artery disease. Without breaking a sweat of model elucidation, get to the nitty gritty data, and exactness, this model could answer difficult issues, each with its own quality. HDPS can be developed and extended in the future. It can, for example, combine therapeutic characteristics other than those listed above. It can also combine data mining technologies from various sources. It is possible to use continuous data rather than just straight information.

[5] introducing The medical services environment is becoming increasingly information advanced, however the amount of learning gained from that information is decreasing due to a lack of information investigation equipment. We must extract the hidden links from the data. There are a few strategies that are now being used in the human services framework to accurately predict heart attacks. The available approaches, such as Nave Bayes, have some shortcomings in terms of precision. This study provides a framework that uses a neural network and a decision tree.

Training and Testing

One of the most difficult aspects of machine learning is predicting future performance on new data. A training set is frequently used to identify the predicted associations from data. The training set is a collection of data points chosen at random to represent the model's inputs and outputs. Typically, a portion of the original, unlabeled data set, referred to as the testing set, is utilised to evaluate the model's quality. Obviously, we are susceptible to some measurement inaccuracies during the training procedure. As a result, determining how effectively a learning algorithm works is linked to the ability to reduce the training error and the difference between the training and testing mistakes. These two parameters correspond to two fundamental ML concepts: overfitting and underfitting, both of which affect accuracy.

MATHEMATICAL MODELING



Where,

Q = User entered input
CB = preprocess
C = feature selection
PR = apply cnn Algorithem
UB = predict outcome

Set Theory

1) Let S be as system which input image

S = {In, P, Op, Φ}

2) Identify Input In as

In = {Q}

Where,

Q = User entered input image(dataset)

3) Identify Process P as

P = {CB, C, PR}

Where,

CB = Preprocess

C = feature selection

PR = apply cnn Algorithem

4) Identify Output Op as

Op = {UB}

Where,

UB = Predict outcome

Φ=Failures and Success conditions.

Failures:

1. Huge database can lead to more time consumption to get the information.
2. Hardware failure.
3. Software failure.

Success:

1. Search the required information from available in Datasets.
2. User gets result very fast according to their needs.

Space Complexity:

The space complexity depends on Presentation and visualization of discovered patterns. More the storage of data more is the space complexity.

Time Complexity:

Check No. of patterns available in the datasets= n
If (n>1) then retrieving of information can be time consuming. So the time complexity of this algorithm is O(n^n).

CNN:

A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm that can take an input image, assign importance (learnable weights and biases) to various aspects/objects in the image, and distinguish between them. As compared to other classification algorithms, the amount of pre-processing needed by a ConvNet is significantly less.

How CNN works::

- Convolution
- Relu layer
- Pooling
- Fully connected

The integral of the product of the two functions after one is reversed and shifted is known as the convolution

$$s(t) = \int x(a)w(t-a)da \qquad s(t) = (x * w)(t)$$

of f and g, written fg:

Convolution is a commutative operation. At any time, it can be interpreted as a weighted average procedure (for this w need to be a valid probability density function).
Discrete Convolution (one-axis):

$$s[t] = (x * w)(t) = \sum_{a=-\infty}^{\infty} x[a]w[t-a]$$

Convolution and Cross-Correlation in Images
Convolution operator : G=H*F

$$G[i,j] = \sum_{u=-k}^{k} \sum_{v=-k}^{k} H[u,v]F[i-u, j-v]$$

Advantages:

[1] Confirming those infected is essential to manage and contain the virus successfully. Without reliable testing, it would be hard to determine the actual rates of cases. Thus, it is vital to identify what these available tests can and can't do to use them appropriately.
[2] Secure and efficient system.
[3] The leading objective of our paper is to enhance the value of multi disease detection.

CONCLUSION AND FUTURE WORK

We plan to develop a multi-disease detection system based on machine learning and CNN approaches that will overcome the current accuracy problem while also lowering death rates from chronic diseases such as lung cancer, brain tumours, and heart disease. After a sickness has been detected, inform people on how to avoid it. In the future, we can apply this technique to a larger number of chronic diseases with more data. The accuracy of the procedure can be improved by increasing the number of diseases and datasets used in the process. Intelligent data analysis is becoming a social requirement for finding effective and reliable disease detections as soon as feasible so that patients can receive the best possible care in the shortest amount of time. This identification has been done in the previous few decades by searching databases for intriguing patterns. Data Mining is a term used to describe the process of extracting information from databases. Finding these patterns, on the other hand, is difficult. As a result, several approaches within Artificial Intelligence have been created, with Machine Learning emerging as a mechanism for offering intelligent data analysis tools.

REFERENCES

[1] Animesh Hazra, Subrata Kumar Mandal,"Heart Disease Diagnosis and Prediction Using Machine Learning and Data Mining Techniques: A Review". Advances in Computational Sciences and Technology Volume 10, Number 7, 2017

[2] Ishaq Azhar Mohammed. (2019). CLOUD IDENTITY AND ACCESS MANAGEMENT – A MODEL PROPOSAL. International Journal of Innovations in Engineering Research and Technology, 6(10), 1–8.
Retrieved from https://repo.ijiert.org/index.php/ijiert/article/view/2781

[3] Anuradha S. Deshpande, Dhanesh D. Lokhande, Rahul P. Mundhe, Juilee M.Ghatol, "Lung cancer detection with fusion of CT and MRI image using image processing." International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 4 Issue 3, March 2015

[4] Abbas Khosravi ,Syed Moshfeq Salaken, , Amin Khatami, Saeid Nahavandi, Mohammad Anwar Hose

"Lung Cancer Classification Using Deep Learned Features on Low Population Dataset" IEEE 30th Canadian Conference on Electrical and Computer Engineering (CCECE) 2017

[5] Hasan, A., Meziane, F., Aspin, R., & Jalab, H. (2016). "Segmentation of Brain Tumors in MRI Images Using Three-Dimensional Active Contour without Edge. Symmetry," 8(11), 132. doi:10.3390/sym8110132

[6] Shadab Adam Pattekari and Asma Parveen "PREDICTION SYSTEM FOR HEART DISEASE USING NAIVE BAYES." International Journal of Advanced Computer and Mathematical Sciences 2015

[7] Ishaq Azhar Mohammed. (2019). A SYSTEMATIC LITERATURE MAPPING ON SECURE IDENTITY
MANAGEMENT USING BLOCKCHAIN TECHNOLOGY. International Journal of Innovations in Engineering Research and Technology, 6(5), 86–91. Retrieved from https://repo.ijiert.org/index.php/ijiert/article/view/2798

[8] S.Florence, N.G.Bhuvaneswari Amma , G.Annapoorani , K.Malathi (2015). "Predicting the Risk of Heart Attacks using Neural Network and Decision Tree." International Journal of Innovative Research in Computer and Communication Engineering 2014