MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA245 – MINI PROJECT

PRO FORMA FOR THE APPROVAL OF THE THIRD SEMESTER MINI PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Academic Year : <u>2021-2022</u>

Mini Project Proposal No : <u>1</u>
(Filled by the Department)

Year of Admission : <u>2020</u>

    1. Title of the Project : <u>Bone deformity identification using machine learning</u>

    2. Name of the Guide : MR NOWSHAD CV

    3. Number of the Student: MES20MCA-2059

    4. Student Details (in BLOCK LETTERS)

                Name Roll Number Signature

              1. <u>VISHNU.K 60</u>

Date:01/12/2021

Approval Status : Approved / Not Approved

Signature of
Committee Members

Comments of The Mini Project Guide Dated Signature Initial Submission :

First Review :

Second Review :

Comments of The Project Coordinator Dated Signature Initial Submission:

First Review

Second Review

Final Comments :

Dated Signature of HOD

Bone Deformity Identification Using Machine Learning

Vishnu.k

Introduction And Objectives:

The success of machine learning algorithms in medical imaging has increased the need for artificially trained models to make them work in the medical field more quickly and efficiently. This paper gives a technique to identify bone fracture using machine learning algorithms, by which workload for orthopedics can be reduced. The significant use of machine learning in this era of big medical data would help gather information from the available x-ray images rather than spending hours in the radiology departments. This Project presents imaging technologies used to identify bone fracture in the human body and give quick results once the x-ray has been taken.

Bone fracture is quite a familiar problem in humans which is caused by falls, accidents, disease as pathological fractures, injury to the overlying skin, hairline fracture, etc. To identify the fracture x-rays and CT scans are used but these cannot always detect the exact location of the fracture .Hence the involvement of machine learning and artificial intelligence would have a great impact on the outcomes and the fracture can be accurately diagnosed. X-Ray imaging technique is often used by orthopedic doctors for fracture detection. Using machine learning tools, we can inventively extract information about the human body conveniently and economically. It is possible because of both hardware and software advancements and the development of existing technology. We know that a single method cannot be applied to all parts of the body, but experimenting with new technology that would be capable of identifying the fractures in our body using one method. The proposed Computer-Aided Diagnosis (CAD) system is a different method to tackle this problem. Artificial intelligence (AI) and machine learning (ML) techniques are revolutionizing several industrial and research fields so it can be applied to the medical sector as well. This system is an AI and Machine Learning based analysis system. It is applicable to all age groups of men, women and children. It provides a summarized and evaluated results of any detected deformity or fracture based on the x-ray images. Implementation of an image processing based efficient system to accurately detect the fractures in the whole human body is the aim of this project.

- To identify bone fracture using machine learning algorithms, by which workload for orthopedics can be reduced.
- It is applicable to all age groups of men, women and children. It provides a summarized and evaluated results of any detected deformity or fracture based on the x-ray images.

Problem Definition:

EXISTING SYSTEM

It is necessary to study the existing system before the attempt is made enlarge it.

Bone fracture is quite a familiar problem in humans which is caused by falls, accidents, disease as pathological fractures, injury to the overlying skin, hairline fracture, etc. Doctors can diagnose bone fractures with **x-rays**. They may also use CT scans (computed tomography) and MRI scans (magnetic resonance imaging).Nevertheless, sometimes the size of fractures is not significant and could not be detected easily.it Requires more manpower .The system is not efficient and it have more Time consuming .

PROPOSED SYSTEM

The entire process of detection of fracture mainly deploys the ridge regression model and the method of edge detection. The main advantage of using a ridge regression model is that despite being almost similar to linear regression it introduces a small bias which can prove to give better predictions in long term applications. Another important concept used in the procedure of detection is edge detection which involves automatic identification of the boundaries present between objects. This segregation of boundaries benefits in breaking up the image into separately examinable areas. Also, ridge regression gives better performance against data which does not have a pattern similar to the data used for training the model due to the diversity present in the images of the dataset. Thus, a ridge regression model coupled

with edge detection gives us the desired outcome. The libraries used in the model of the given work are numpy, pickle, opencv2, tensorflow, sklearn and similar libraries. Different regressors imported are KNeighbour, DecisionTree, RandomForestClassifier and similar. The python pickle module is useful in performing the function of converting the data into a byte stream and vice versa. In other words the python object structure is serialized and deserialized so as to save it to the disk. For the model in this work two lists were created, one for training and another for testing respectively. For the first set of labels, the corresponding model returns a numpy array used for training. This is followed by usage of pickle library which performs its functions as mentioned above and stores the images to the file or database. These lists are then converted into input and output arrays for both training and testing arrays. An x-ray image is taken as input for detection of fractures. Manual edge detection and median filter smoothing are performed on the images multiple fractures in the bone structure as well. One more important factor to be taken into consideration is the size of the 1D array created from the flattening of the feature vectors of the images present in the dataset. Image thresholding is performed and an optimum value of pixel size is fixed. So, an optimal size was chosen for the images of the dataset and the dataset was customized accordingly.

Basic functionalities:

FUNCTIONAL MODULE

• CNN ALGORITHM

CNN is used for bone fracture identification. The system proposed here is a CAD system with very specific and sensitive. A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. CNNs are used for image classification and recognition because of its high accuracy.

MODULE DESCRIPTION
· ADMIN
· USER

Admin
• Login
• Data set management
• View users
• Feedbacks
• View prediction results

User
• Register
• Login
•Upload Image
•View Prediction
• Feedback

Tools / Platform, Hardware and Software Requirements:

HARDWARE REQUIREMENTS

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.
· Processor : Intel Pentium Core i3 and above, 64 bits
· RAM : Min3GB RAM
· HARD DISK: 10 GB

SOFTWARE REQUIREMENTS

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

- OPERATING SYSTEM: WINDOWS 10
- FRONT END: HTML, CSS, JAVASCRIPT
- BACK END: Mysql
- IDE USED: JetbrainsPycharm, Android studio
- TECHNOLOGY USED: PYTHON JAVA
FRAME WORK USED: Flask

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Academic Year : <u>2021-2022</u>

Mini Project Proposal No : <u>2</u>
(Filled by the Department)

Year of Admission : <u>2020</u>

1. Title of the Project : <u>A Review on Data Mining &Machine Learning Methods For Student Scholarship Prediction</u>

2. Name of the Guide : MR NOWSHAD CV

3. Number of the Student: MES20MCA-2059

4. Student Details (in BLOCK LETTERS)

      Name Roll Number Signature

1. <u>VISHNU.K</u>   <u>60</u>

Date:01/12/2021

Approval Status : Approved / Not Approved

Signature of
Committee Members

Comments of The Mini Project Guide <u>Dated Signature</u> Initial Submission :

First Review :

Second Review :

Comments of The Project Coordinator <u>Dated Signature</u> Initial Submission:

First Review

Second Review

Final Comments :
Dated Signature
of HOD

A Review On Data Mining and Machine Learning
Methods for Student Scholarship Prediction

Vishnu.k

Introduction And Objectives:

This paper talks about the different Machine Learning and Data Mining Techniques used to prediction of scholarship and outcoming results. Some of the Machine Learning and Data Mining methods are explained and also the problems faced. The merits and demerits of ML and DM methods are discussed. This also concluded the best method used for scholarship prediction. A scholarship gives a financial help for a students to continue with further education. Usually, scholarships are provided by the governments or non-governments organizations. When students are recognized for their accomplishments. It gives them the confidence to purpose other goals.There are some of the common types of scholarships such as merit based, student specific and carrier specific. Different schemes of scholarships are provided for the students based on the different eligibility criteria. Academic scholarships probably use a Grade point average (GPA) to select awardees. Athletic scholarships are generally awarded based on many criteria such as performance in a all subject, club participation, community services etc. This paper discussed about ML/DM method based scholarship prediction to provide scholarships to students where eligible students are automatically predicted based on the given constraints such as percentage, grade point average, marks, annual income, communication skills etc.

・Goal or aim of our project is to automate the scholarship departments.

  ・students will come to know about various beneficiary schemes provided by the government, and they can view the scholarship schemes available for them. They can utilize those schemes for the improvement of their surrounding.

Problem Definition:

EXISTING SYSTEM

At present the college maintains manual records, in the form of registers, files, etc. to store the scholarship details of the students. New scholarships to be issued, involves heavy paper work. It also leads to data redundancy. The analysis part includes a detailed study of the existing system.

Limitations
  ・Time delay
  ・Redundancy
  ・Accuracy
  ・Information Retrieval

PROPOSED SYSTEM

The proposed system has many benefits. Once the existing system is automated all the drawbacks of the present system can be overcome.Goal or aim of our project is to automate the scholarship departments.The newly developed system consumes less processing time and all the details are updated and processed immediately. Since the screen provides real time help messages and is very user friendly, any user can get familiarized.

Advantages

  ・By using this system time consumption will be reduced.
  ・time consumption will be reduced.
  ・Students can easily know about the information of scholarship details
  ・High accuracy
  ・Scholarship Officer can easily check the eligible criteria of each and every student.
  ・Scholarship Officer can easily generate the record of students who are eligible for the scholarship

Basic functionalities:

FUNCTIONAL MODULE

• SVM ALGORITHM

SVM is a supervised machine learning algorithm which can be used forclassification or regression problems. It uses a technique called the kernel trick to transform your data and then based on these transformations it finds an optimal boundary between the possible outputs.

• DECISION TREE

Decision tree algorithm uses a tree-like graph structure having both classifier and regression. The structure contains root node which connects to subnodes, through links which connects to leaf nodes. Each node represents attributes and each leafnodes ends with an outcome or target result. Decision tree rules can be constructed from a training data set with help of many algorithms such as ID3, classifier and regression tree.

• K-NEAREST NEIGHBOR ALGORITHM

It is a simple ML algorithm which comes under a division of a non-parametric model. The main aim of the algorithm is to predict an outcome value from input data by "Close" inputoutput pairs that are available in training. The KNN algorithm is easy to use, and it suits for large datasets also. The algorithm is versatile. It can be used for classification, regression and search

MODULE DESCRIPTION

Admin:

- Manage colleges
- View Scholarships
- Manage Scholarship officer
- View Application request

Scholarship Officer:
- Upload Scholarship
- View application
- Grant application
- Enquirys

Student:

- View Scholarship
- Send application
- View Status
- Send Enquiry

Tools / Platform, Hardware and Software Requirements:

HARDWARE REQUIREMENTS

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

- Processor : Intel Pentium Core i3 and above, 64 bits
- RAM : Min3GB RAM
- HARD DISK: 10 GB

SOFTWARE REQUIREMENTS

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

- OPERATING SYSTEM: WINDOWS 10
- FRONT END: HTML, CSS, JAVASCRIPT
- BACK END: Mysql
- IDE USED: JetbrainsPycharm, Android studio
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Mini Project Proposal No : 3
(Filled by the Department)

Year of Admission : 2020
Academic Year : 2021-2022

1. Title of the Project : Machine Learing Algorithm for Stroke Disease Classification 2.

Name of the Guide : MR NOWSHAD CV

3. Number of the Student: MES20MCA-2059

4. Student Details (in BLOCK LETTERS)

      Name Roll Number Signature

   1. VISHNU.K   60

Date:01/12/2021

Approval Status : Approved **/** Not Approved

Signature of
Committee Members

Comments of The Mini Project Guide Dated Signature Initial Submission :

First Review :

Second Review :

Comments of The Project Coordinator Dated Signature Initial Submission:

First Review

Second Review

Final Comments :

                                 Dated Signature of HOD

Machine Learning Algorithm for Stroke Disease Classification
Vishnu.k

Introduction And Objectives:

Stroke is a major cause of mortality and high morbidity in causing disability in many countries. It is important to receive a correct diagnosis before stroke treatment starts,because treatment for stroke depends on the type of stroke suffered. This study classifies stroke patients into ischemic stroke and hemorrhage stroke based on CT scan image data.Ischemic stroke is generally caused by a blockage in a blood vessel. While hemorrhage stroke is caused by bleeding in brain tissue.Research related to the diagnosis and prediction of stroke was carried out by Chiun-Li Chin, et al. [4] who developed an early ischemic stroke detection system automatically using the CNN Deep Learning algorithm. The CNN architecture used uses two convolutional layers, namely the pooling layer and the fully connected layer. The main purpose of the pooling layer is down-sampling, which means the layer will compress the amount of data and parameters to reduce the problem of overfitting. The classification results obtained an accuracy value of 90%. Other researchers using CNN's Deep Learning architecture are Marbun, JT. et al. [5]used an open stroke dataset obtained from www.radiopaedia.org to classify patient data into three classes: normal, ischemic stroke, and hemorrhagic stroke through CT scan images. The accuracy obtained is 90%.While other researchers using the same dataset, Badriyah,Tessy et al. [6] do hyperparameter optimization on Deep Learning algorithm to improve stroke diagnosis accuracy.The random search optimization algorithm and Bayesian search for hyperparameter tuning in Deep Learning can increase accuracy to 100%.The Support Vector Machine algorithm also gave satisfying results in research conducted by Jenna R.S and Dr.Sukesh Kumar [9] who predicted stroke by using the performance of various kernel functions in the Support Vector Machine method. The best experimental results obtained in the Kernel Linear Function by 91.7% and Polynomial by 89.0%.

Apart from studies using certain methods in classifying medical datasets, the research was conducted by GurAmrit Pal Singh and P.K. Gupta [3] detected and classified lung cancer by using several algorithms in machine learning,namely K-Nearest Neighbor (KNN), Super Vector Mechine (SVM), Decision Tree, Naïve Bayes, Stochastic Gradient Descent (SGD), Random Forest and Multilayer perceptron (MLP) which is one type of Deep Learning architecture.From the results of the classification of medical image dataset of 15,750 with a distribution of 6,910 for the benign class and 8.84% for the malignant class the highest accuracy was 88.55% with the MLP approach.
For research that combines several methods conducted by HimaHaridas, and Aswathy Wilson [7] who compared the three approaches. The first approach uses Neural Network (NN) algorithm, the second approach uses a combination of two algorithms namely Principal Component Analysis (PCA) for deminsion reduction and classification using Neural Network. While the third approach uses three algorithms namely Decision Tree for feature selection, PCA for deminsion reduction and Neural Network for stroke prediction. The results of comparisons made using the three approaches give the following results 95.0%, 95.2%, and 97.7% where the best results are given in the third approach.

• This study preprocessing datato improve the image quality of CT scans of stroke patients. • This study classifies stroke patients into ischemicstroke and hemorrhage stroke based on CT scan image data. • The random search optimization algorithm and Bayesian search for hyperparameter tuning in Deep learning can increase accuracy to 100%.

Problem Definition:

EXISTING SYSTEM

There are many similarities between Hemogrphic stroke and ischemic stroke it is difficult to classify the cases accurately using medical procedures. Furthermore, there are no clear boundaries between these types. This paper reviewed and analyzed the current studies on classification of ischemic stroke..

PROPOSED SYSTEM

The system proposed in this paper can provide useful analytical information for medical staff, patients with stroke with high recurrence potential, or elderly people with high incidence of stroke. It is a significant finding that stroke can be predicted at low cost during daily activities such as walking situations. This study is meaningful, as it can detect the risk of stroke early, before an individual is taken to the emergency room, thus allowing for access to treatment within the golden period. However, to improve the predictive accuracy and performance of real-time

predictive models of stroke disease, analysis and predictive models should be studied by integrating health examination data and CT analysis information in a clinical setting.

Basic functionalities:

FUNCTIONAL MODULE

• CNN ALGORITHM

A convolutional neural network is a feed-forward neural network that is generally used to analyze visual images by processing data with grid-like topology. It's also known as a ConvNet. A convolutional neural network is used to detect and classify objects in an image.

MODULE DESCRIPTION

- Admin
  - Add disease
  - View booking
  - View Images
  - View Prediction
  - View Rating
- User
  - View Diseases
  - Booking
  - Add Images
  - View Prediction
  - Rating

Tools / Platform, Hardware and Software Requirements:

HARDWARE REQUIREMENTS

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