DESIGN SYSTEM TO PREDICT TYPE OF LEARNER DEPENDING UPON ACTION OF LEARNER

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Abstract: The goal of this work is to introduce a system to predict the type of learners based on body actions of learners in collaborative learning. Generally group of students study together in collaborative learning, understanding level of the learners can be identify either by expression or movement of a part of body. The proposed system can help to classify the different types of learners based on their expressions. Machine learning techniques can identify complex expression or body actions of learners. The proposed system focuses system architecture which is based on machine learning to predict the type of learners. The proposed system based on different techniques such as image segmentation, feature extraction, data preprocessing and classification algorithms in machine learning.

Keywords: Machine Learning, collaborative Learning

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I INTRODUCTION

To become successful learner effective communication and collaboration are the important parameters in collaborative learning. Many times teachers consider every learner is unique in terms of their learners talents and most of the times learners may also have strong emotions about the concept understanding, in such situation need not introduce to the same concept or lesson to all learners multiple times and also it is completely unfair to ask the learners to answer or express learners understanding of the concept instead of that we can classify the group of learners depending on the expressions and body actions we can predict the type of learners, based on that predict the type of learner and depending on that change the method of presenting the concept to so that each learner can understand the concept properly.

As a team or as an individual may affects the capability to do well in collaborative learning. To work on such dynamic behavior we need to focus on step-by-step work.

The proposed system will help to classify and predict the learners into different categories based on the expressions or actions of learners in the classroom learning process.

In the proposed system, input is in the form of image then image segmentation process need to carry out to perform feature extraction, after the data preprocessing need to perform cross validation and then by applying classification algorithm we can classify and predict the group of learners.

II LITERATURE REVIEW

Image segmentation in an image it is one of the most important benefits for identification of objects. Maximum methods of image segmentation can be positioned in the most important categories

1. Specific feature clustering or Thresholding. 2. Margin recognition. 3. Region mounting. [2]

The algorithms of segmentation of images are based upon on the two fundamental attributes of the luminance: similarity and discontinuity . Algorithm of Edge detection is depend on the discontinuity. Likewise, regional separation, threshold processing, region growing, and polymerization are based on similarity[1].

Region based and Boundary based methods these are two categories comes under image segmentation which are based upon two properties discontinuity and similarity. Boundary based methods depending upon disconnectedness and region based methods depending upon similarity. [10]

Cipresso (2015) introduced system to study behavior dynamics with computational psychometrics[3].

P. Chopade, S. M. Khan, K. Stoeffler, D. Edward, Y. Rosen, and A. von Davier introduced framework which talks about architecture of system and methodology to search various patterns of interactions, learning and assessment of effective teamwork of collaborative learning environment based on machine learning , Artificial Intelligence and computational psychometrics [4].

I. Magnisalis, S. Demetriadis, and A. Karakostas introduced impact of adaptable and intelligent systems which are developed to support shared literacy[5].

III SYSTEM ARCHITECTURE

Fig. 1 describes the proposed system architecture, the proposed system architecture works in below mentioned multiple steps .

Step 1 : Input Image need to be collected

Step 2 : Use image segmentation technique

Step 3 : Feature extraction

Step 4 : Data Preprocessing

Step 5 : Cross Validation

Step 6 : Determine Best Classifier

Step 7 : Evaluate Classifier

Step 8 : Predict the learners.

Initially in the first step take image of collaborative learning environment as an input.

In the step second we focusing on image segmentation technique which is a subset of image processing need to use to divide and image into different small objects or regions. Passing the name to all the pixel in an image and separation of an image into non overlapping parts is called as image segmentation. In an image it is one of the most important benefits for identification of objects[9].

By using segmentation process we can extract object from rest of the image or image can be break into segments so that we can perform more processing[6].

In this step input get processed through segmentation of images, in this process input image is divide into multiple image objects or subgroups of pixels so that analysing of image become easy. Image segmentation algorithms helps to cut up and group a sure set of pixels together from image. After that we will give name to the pixels, pixels with the same name comes under one group. In the proposed system we use Specific feature clustering method of image segmentation. In this method input image segment into clusters with similar characteristics.
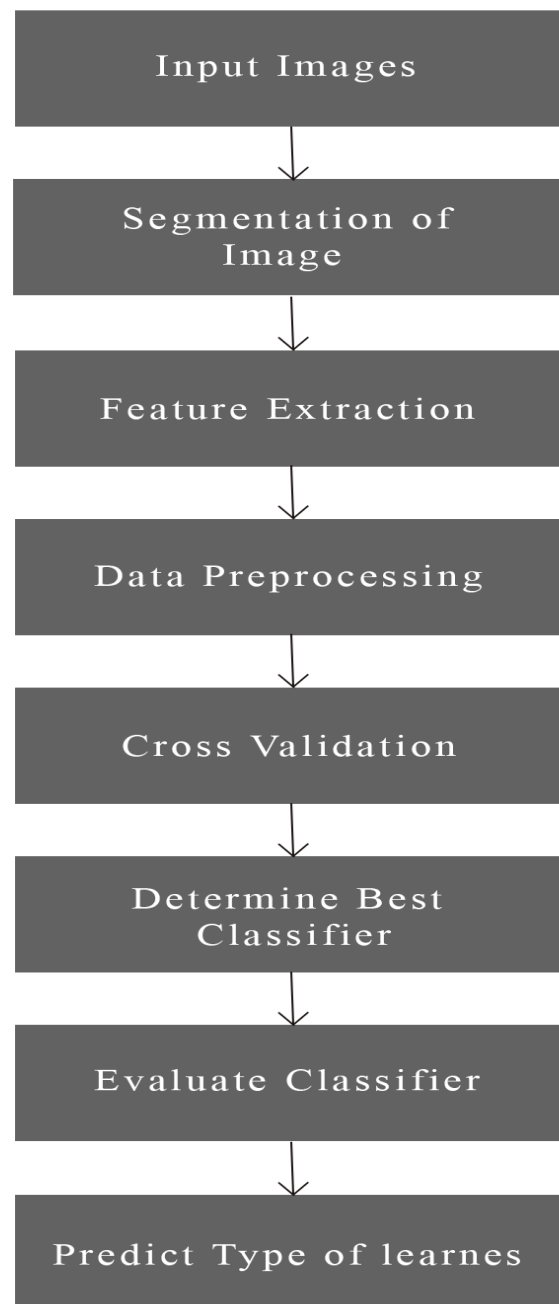

Fig. 1 System Architecture

The step three is mainly focusing feature extraction process, with the help of feature extraction process we can reduce the number of features. Feature selection is also another common technique to minimize number of feature in the dataset. feature selection process is the process of selection of most suitable features for the training machine learning model, as the performance of a machine learning algorithm depends on the features of dataset and needless and redundant features affect the performance of the algorithm. So in this step we should keep only those

features in the dataset that actually help. Such model with fewer features are less prone to errors.

Step four is data preprocessing is the process carried out before the passing data to an algorith where data need to transform. In this technique clean data is generated from raw data.

Data preprocessing is one of the important process, if you want to achieve better result from the system which is based on machine learning[7]. In the process of data cleaning errors and inconsistencies present in the data get removes which improves quality of data. Which can be done by removing unwanted data, handling missing values, noise and outliers.

In step five we are focusing on cross validation process is used to check effectiveness of system, train/test split is one of the common technique used in cross validation, In this technique data is split into testing and training and sets. To train the model Training dataset is used and for validation testing dataset is used [8].

In the sixth step best classifier technique need to check by applying different classification techniques such as Decision Tree, Support vector machines(SVMs) or by Neural Network.

Decision Tree is useful to handle multi-output problems and also it requires minimum data preparation. In high dimensional spaces support vector machines is very helpful and memory efficient is one of important feature of SVMs.

The step seven is based on sixth step in the seventh step, evaluate classifier based on performance of of all the classifier.

The step eight is based on the the classification in step seven we can predict the fast learner and slow learner .

IV APPLICATIONS

This system can be applicable in various collaborative learning process like collaborative classroom teaching-learning process where based on learners behavior one can predict slow and fast learners.

This system can be also applicable at cooperative learning process where the understanding the concept and learning success is depends upon the learners and also understanding concepts of all the team members based on knowledge and resources.

V CONCLUSION AND FUTURE WORK

In this work we are presented architecture which is completely machine learning based which is useful to classify and predict the learners where input collected as an image,

input image can be an image collected from collaborative learning environment.

Audio or video of a learners can be input to predict the type of learners, So in future we will try to work on different inputs like audio and video.

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