

Analysis of Human Behavior for Predicting their nature

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Abstract - Behavior is the most important aspect of our life. It has the power to depict everything related to us. It become somewhat difficult to predict someone's behavior if we don't know that person very well or we just meet them. However by just seeing the person we cannot predict the mental stability of the person. To make accurate judgment we need to analyze the behavior so that we will not make any mistake in predicting their behavior. To analyze their behavior we need some information of the person. By asking several questions we can get it. One of the important point to note is, asking more questions is not our goal but asking appropriate Questions and gaining maximum knowledge is our goal. So framing the questions which will give us maximum information of user is important.

One more way to predict the behavior is our likes and dislikes. It is indirect way to depict what user thinks or what's going in their mind. So to achieve this, we will give them some sets of images and user need to select the one which is mostly related to them or the one which they like the most.

By analyzing all these constraints we will predict the behavior. This paper will provide an efficient way of predicting the behavior of people using machine learning. It will also help the people who are disturbed emotionally or mentally to get back to the point from which they will focus on making their lives better.

Key words: Behavior analysis, Machine learning.

1. INTRODUCTION

Behavior is a way in which human beings or animals react in a particular situation. Our behavior depicts everything about us. It's quite easy to depict someone's personality if we know that person very well. But there are many situations where without having prior knowledge of person we need to find their personality. Behavior analysis is important to know the mental health of the people. Mental health determines how we handle out emotions, stress and how we think and feel. It is important for every age group as we cannot predict that specific age

group is not stressed. When people are mentally stable they focus on their life i.e. how to make it happier. But when person is mentally or emotionally disturb they are not able to concentrate on anything that is going in their life. So by keeping all this things in mind we try to help the people who are facing these kinds of problems. We try to create a project which will help maximum people to improve their life. To understand the behavior of our users we are asking them some questions.

There are three sections:-

1. User needs to select the favorite color from the set of colors available.
2. There are some questions that user need to give rating based on how much they agree or disagree.
3. There is specific set of images, from each set user need to select the one which he likes or the one to which they relates the most.

After entering all this information we will analyze their behavior. Our main goal is to find people who are stress, are suffering from depression, are unhappy, etc. Once we know the users behavior and if it matches with any of the behavior like stress, depression, etc. we will try to help that person to make his life better.

2. HUMAN BEHAVIOR ANALYSIS

We will try to find out the human behavior based on the selections done by each of the participant. Each participant need to perform a series of preference tests, namely

- 1) Selecting the preferred images from the pre-defined gallery.
- 2) Choosing liked color combinations from predefined sets.
- 3) Answering some questions.

After choosing preferences, analysis of our selection is been done for predicting the nature of person. This analysis can help us to understand the mental condition of person and if he is suffering from any problem we can help them. This analysis can also be used to predict the criminal mentality of person. It will help us to know the person better and help us to understand the psychological behavior. It can help us to find the mental strength of the person.

3. MACHINE LEARNING

For analyzing the collected data we will use Regression. In regression there are various types like Linear Regression, Logistic Regression, Ridge Regression, Lasso Regression, Polynomial Regression, Bayesian Regression, etc. So from all these types we are going to use Linear Regression.

Linear Regression is classified into two types i.e. Simple Linear Regression and Multiple Linear Regression. In Simple Linear Regression there is a single independent variable i.e. input and a dependent variable i.e. output. In Multiple Linear Regression there are two or more independent variables i.e. input and one dependent variable i.e. output. In our Project there are more than 2 independent variables so we had used Multiple Linear Regression.

In our project there are many independent variables like color, questions, favorite image. So we have to map all these things to get the behavior of the user.

4. LITERATURE REVIEW

4.1. Automated Human Behavioral Analysis Framework using Facial Feature Extraction and Machine Learning

This model uses Behavioral analysis framework (BAF) which identify, detect, and control people's emotions and find out treatments to regulate their emotions immediately.

In this model, firstly BAF captures the images/subject by using a camera sensor. In the facial feature extraction technique, the features are extracted from the images using the 14-point and 2-D DCT method. These extracted features are classified into different emotions such as anger, neutral, disgust, surprise, happiness using emotion classification, and emotion recognition technique. Support vector machine (SVM), Gaussian mixture models (GMM), and K-nearest neighbors (KNN) are used in classification. The confidence of each emotion is analyzed and the emotion with maximum rank and confidence is considered as the result (behavior of the person). However, if the camera quality is a blur or the frame rate is too slow then it may be difficult to extract features from the blur

images. So, to get accurate result better quality cameras must be required.

4.2. Behavioral Prediction of human by signature and handwriting analysis using Mat lab

This technique is used to predict the behavior of the person from features that are extracted from that person's handwriting or signature using MATLAB tools like BPN, SVM. Features are like pen pressure, length of signature, baseline, the height of the first letter, length of the signature, letter i, letter f, and a document to identify the personality of a writer.

Support Vector Machine (SVM) are supervised learning models that analyze data and recognize the patterns, used for classification which takes the input as a function and gives a better and exact result.

In this, firstly user uploads the signature images through MATLAB code and then the images of signatures are uploaded. This signature sample becomes a digital signature and it is given to SVM as an input. RBF is used to give the input to the SVM. SVM takes extracted features as input and predicts the behavior of the person.

There are some disadvantages of this technique i.e. if the signature image is blur or ink of pen is light then it may be difficult to extract the features from the person's handwriting.

4.3. The emotion prediction model based on audience behavior

This model is used to predict the emotions, which includes feelings of audience and information of audience. In that they used the technologies named as Human-Computer Interaction (HCL) has evolved based on the Human-Human Interaction (HHI). By using this technology, they have found the facial expression, voice, gesture, posture and communication. They used two methods to predict the person's emotion. First method using images including facial expression analysis, gesture and posture analysis. And in second method using sound including voice analysis. For accuracy and ease image analysis has been studied more than the sound analysis. This model predicts the emotion in two ways using emotion-specific behaviour and compares the performance. First they extract the features of audience behaviours from five emotional stimuli. And then they construct the emotion prediction model. HaticeGunces studied emotion recognition experiment from face expression and gesture. For gesture recognition they used the vision-based visual information that has been performed. In Gesture recognition most studies used Kinect to recognize

specific parts of the body (especially the hands). In that they have used camera for accuracy they have constructed three step procedures for proposed model 1. Data collection module of audience response.

2. Data analysis module for audience response.

3. Prediction module of audience emotion. Using the mixed signal with facial feature and sound they have improved the predictability of emotion in the future.

4.4. Human Behavior Prediction for Smart Homes Using Deep Learning

In this they have proposed two algorithms namely DBN-ANN and DBN-R which are depended on the deep learning framework for analyzing and predicting the different activities in the surrounding. In particular, DBN-R shows an accuracy with 43.9% (51.8%) for predicting recently activated sensors based on MIT home dataset 1 and dataset 2, while previous research based on the n-gram algorithm has display an accuracy with 39% (43%) on the given similar dataset. Aipperspach et al. has proposed and applied the n-gram algorithm, which is developed and used for natural language processing. Kubota et al. suggested a human behavior prediction algorithm for a partner robot. Deep learning is a powerful tool for learning multifarious and large- scale problem. The cascading multiple restricted Boltzmann machines (RBMs) were typically constructed by model for deep learning. They improve the sampling method which can estimate the model distribution more accurately using bootstrapping and selective learning. The cascaded structure is used in deep learning. It is also called as deep architecture. Deep belief network (DBN) consists of multiple restricted Boltzmann machines (RBMs), which are energy based unsubstantiated learning models. In the Restricted Boltzmann Machine, they use the algorithm for prediction using deep learning. In Deep Architectures for Prediction they used two methods named as DBN-ANN and DBN-R. Gaussian-Bernoulli restricted Boltzmann machine (GB-RBM) can be used for this persistence. We plan to extend GB-RBM to more general human behavior prediction problems.

4.5. Summary of Literature Review

Title of Paper	Techniques Used	Drawbacks
Automated Human Behavioral Analysis Framework using Facial Feature Extraction and Machine Learning	An automated behavioral analysis framework (BAF) is used which helps to perform emotion identification also to analyze emotion recognition using visual signals. 1. Facial Feature Extraction 2. Machine Learning	If the frame rate is too slow or the camera is too blurry, it may be hard to pick up on subtleties. So, multiple high qualities of cameras are required.
Behavior Prediction of Human by signature and handwriting analysis using matlab	MATLAB tools: <ul style="list-style-type: none"> • BPN • SVM 	If the signature is blurring then it is difficult to find the nature of that particular person.
The emotion prediction model based on audience behavior.	HHI technology use to analysis of Communication, including words, voice, gesture, posture, and face expressions, makes people share emotion, information and relationship. The Human-Computer Interaction (HCI) technology has evolved based on the Human-Human Interaction (HHI).	1. Output may come wrong if in case sensors are not running or malfunctioning. 2. Camera may be not working properly because of blur images.

Human Behavior Prediction for Smart Homes Using Deep Learning	There are two algorithms DBN ANN and DBN-R, based on the deep learning framework for predicting various activities in a home.	Widely used learning method for restricted Boltzmann machines only.
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5. CONCLUSIONS

In this paper, a predictive model to recognize human behavior based on the features that are extracted from a user is proposed. Human Behavior Analysis is done by using different types of techniques like an automated behavioral analysis framework (BAF), MAT LAB tool, HHI technology etc. This techniques has some drawbacks like slow frame rate, sensors are not working, etc. We are going to implement the model using Machine learning, which we will use for analysis purpose. Our system will consists different phases like choosing favorite color, choosing the preferred images from the pre-defined gallery and answering some questions. While gathering requirement our main focus will be on getting more information of user in minimum number of responses. While asking questions to the user we need to ask only those questions which will give us more as well as correct information. Similarly, for

Image sets we need to select images whose meaning is correctly understood by the users. He/she should not get confused by the image sets. After getting the response of user we will use the machine learning for analyzing the data. By using machine learning we will try to reduce the previous drawback

6. REFERENCES

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