**Prediction of People's Abnormal Behaviors Based on Machine Learning Algorithms**

Some improper behaviors in specific situations may put people in danger, such as smoking in a gas station, therefore they need to be detected. This paper tries to find out the best Machine Learning algorithm to address that kind of prediction problems. Datasets related to behavior detection are collected, whose categories consists of smoking, calling and normal behaviors. Experiments based on several famous algorithms are conducted, including Linear Support Vector Machine (LSVM), Kernel Support Vector Machine (KSVM), Decision Tree Classifier (DT), Random Forest Classifier (RF), K-nearest Neighbors (KNN) and K-Means Clustering. Additionally, Confusion Matrix and Mean Squared Error (MSE) are used to judge the performance of each algorithm. Finally, Principal Component Analysis (PCA) visualizes the outcome of the best algorithm. The results show that Random Forest Classifier (RF) achieves the best performance and is capable of predicting people’s abnormal behaviors with an accuracy of 82%.

**EXISTING SYSTEM:**

In the previous studies, there are some studies that have already tried to apply the machine learning into the field of computer vision about human. By designing a convolutional neural network, the computer managed to distinguish different human's behaviors. What' s more, Zhu et al. also gave out an algorithm based on deep learning to monitor students' behaviors during the test. In terms of smoking behavior detecting, Zhang et al. have developed a machine learning algorithm in the method of decision tree. Their model achieved 84.11% accuracy with the best performance

**DISADVANTAGES OF EXISTING SYSTEM:**

1. Results are not up to the mark.
2. The dataset this paper uses only one class(type).

**Algorithm:** **SVM, Decision tree, k-means**

**PROPOSED SYSTEM:**

For instance, smoking, talking on the phone is hard to detect even by our naked eyes as well. The phone may be too small that is blocked by people's hand, thus making the problem more complicated. In, Zheng used Machine Learning algorithms based on Support Vector Machine (SVM) as well as Convolutional Neural Network (CNN) to predict people's walking upstairs and downstairs behavior, which achieved 93.5% as the highest accuracy. However, this paper would like to compare the mainstream machine learning algorithms in detecting the smoking and calling behaviors and figure out which one is the best solution to the problem. The rest of this paper is divided into following parts: Part 2 shows the datasets this study picked and its problems to be solved method. Then visualization of each class and results of different machine learning algorithms will be presented in Part

3. Finally, the conclusion will be summarized in Part 4.

**ADVANTAGES OF PROPOSED SYSTEM:**

* achieved 93.5% as the highest accuracy.
* The dataset this paper uses has three classes: Smoking class, Calling class and Normal class.

**Algorithm:** Convolutional Neural Network (CNN), Machine Learning algorithms, Support Vector Machine (SVM)

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Intel Core i3.
* Hard Disk : 1TB.
* Monitor : 15’’ LED
* Input Devices : Keyboard, Mouse
* Ram : 8GB.

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows 10.
* Coding Language : Python
* Tool : PyCharm, Visual Studio Code
* Database : SQLite

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