EFFICIENT TWINS IDENTIFICATION AND CLASSIFICATION USING MACHINE LEARNING

[1]Dr P. Rama, [2]B. Purusotham, [3]G. Mahesh
[4]G. Bhanu Prakash, [5]B. Sairam

[1]Assistant Professor, [2,3,4,5]Students
Department of Computer Science and Engineering
Bharath Institute of Higher Education and Research
Chennai, India

Abstract- **The main concept of our work is to develop an identical twin detection approach that increases the accuracy of classification and identification using a class of convolutional neural networks (CNN). Our method is based on the observation that twins have similar facial features. Trained with CNN to learn the facial features. A general face recognition model is developed based on a system comprising several features or attributes. Face detection, feature extraction, and face recognition are the key steps in any twin detection process of twins. Then trained with CNN to extract the facial features of an input image. It is applicable to all image data sets. We have conducted experiments on a publicly available twin dataset, and the result of this method shows that this method can achieve high accuracy.**
In our project, we have used algorithms such as Decision Tree (DT) and Convolution Neural Network (CNN) in terms of accuracy.

INTRODUCTION
• The increase in twin births has created a requirement for biometric systems to accurately determine the identity of a person who has an identical twin.
• The ability to distinguish between identical twins based on different biometric modalities such as face, iris, fingerprint, etc., is a challenging and interesting problem in the biometric area.
• Fingerprint analysis and retinal or iris scans, these methods rely on the co- operation of the participants, whereas a personal identification system based on analysis of frontal or profile images of the face is often effective without the participant's cooperation or knowledge.
• There are two types of twins: monozygotic (or identical) and dizygotic (or non-identical).

LITERATURE SURVEY
Authentication of Identical Twins Using Tri Modal Matching Publisher: IEEE 2021, B. Lakshmi Priya; M. Pushpa Rani
• In this paper, a new approach for identifying identical twins on the basis of a multimodal identification system that uses three different features namely face, finger print and lip print to identify people.
• A newly developed multimodal biometric system possesses a number of unique qualities, starting from utilizing Kernel Similarity with Euclidean distance methods for face matching, Possibilistic Fuzzy C-means clustering (PFCM) for fingerprint matching and Fixed K-means Clustering features for lip print matching and fused the information for effective recognition and authentication.

Coefficient of Variation based Decision Tree Classifier for Face Recognition with Invariant Moments. IEEE(2020). Redla, S. S., Mallik, B., & Mangalampalli, V. K.
• It measures the ability of face recognition algorithms to distinguish between identical twin siblings. The algorithms were run in verification mode.
• Recognition experiments are conducted using three of the top submissions to the Multiple Biometric Evaluation (MBE) 2010 Still Face Track. The experimental dataset consists of images taken of 126 pairs of identical twins (252 people) collected on the same day and 24 pairs of identical twins (48 people) with images collected one year apart.

Phillips, P. J., Flynn, P. J., Bowyer, K. W., Bruegge, R. W. V., (2011). Distinguishing identical twins by face recognition. Face and Gesture 2011.
• It has developed a facial recognition approach which increases accuracy of classification and identification using a class of decision trees based on coefficient of variation gain as splitting criteria
• Paper discusses about the Coefficient of Variation based decision tree classifier (CVDT) using 7 Hu invariant moments, Mean, S.D and CV as feature measures. After discretization and extracting redact feature set.

SYSTEM REQUIREMENT
HARDWARE REQUIREMENTS
Processor   : 3Processor.
Hard Disk   : 500GB.
Monitor   : 15''LED Input
Devices   : Keyboard, Mouse

RAM   : 4GB

SOFTWARE REQUIREMENTS
Operating system   : Windows10.
Coding Language   : Python Web
Framework   : Flask

EXISTING SYSTEM
In existing system, we have used Decision Tree method which will help in dividing the data in the form of tree structure. By following tree structure, it best fit data can be easily be selected and used for classification resulting in less accuracy compared to proposed.

Decision Tree
IT is a decision support tool that uses a tree-like model of decisions and the possible consequences. It is one way to display an algorithm that only contains conditional control statement

Decision trees are commonly used in operations research, specifically in decision analysis, to help identify a strategy most likely to reach a goal, but are also a popular tool in machine learning.

A decision tree is a flowchart-like structure in which each internal node represents a "test" on an attribute each branch represents the outcome of the test, and each leaf node represents a class label. The paths from root to leaf represent classification rules.

PROPOSED SYSTEM
In proposed system we have used CNN algorithm. In this method CNN classifier is used for early detection of twins from the images. The CNN shows higher classification performance than onther classifier. And CNN technology will be used in feature extraction and training.

The steps involved are

1) Training – In training all the collected images are trained to the model and all necessary features are extracted and stored in the database.

2) Classification – After training, the CNN will classify the given new input as either twins or non twins.

Convolution Neural Network (CNN)
•   A   Convolution Neural Network (CNN) is a class of artificial neural networks where connections between nodes form a graph along a temporal sequence.

•   This allows it to exhibit temporal dynamic behavior. Derived from feed forward neural networks, ECNNs can use their internal state (memory) to process variable length sequences of inputs.

•   This makes them applicable to tasks such as un segmented,

•   connected handwriting recognition or speech recognition.

•   The term "Enhanced neural network" is used indiscriminately to refer to two broad classes of networks with a similar general structure, where one is finite impulse and the other is infinite impulse. Both classes of networks exhibit temporal dynamic behavior.

•   A finite impulse recurrent network is a directed acyclic graph that can be unrolled and replaced with a strictly feed forward neural network, while an infinite impulse recurrent network is a directed cyclic graph that cannot be unrolled.

ARCHITECTURE DIAGRAM

BLOCK DIAGRAM

SCREENSHOTS

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