

Artificial Neural Network based Signature Recognition and Verification System

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Abstract

The signature of a person is an important biometric attribute of a human being which can be used to authenticate human identity. In present day signature use in many transactions in day today life and we can see some people are trying to miss use signature for achieve their narrow goals. So goal of this project is provide strong way system recognize and verify hand written signature.

Signatures are intrapersonal biometric attribute and it differs from people to people. Even collection of signature of one person also differs from each other. But when we consider that collection of signatures, there is certain pattern which follows all signatures. So Signature recognition is such kind of pattern recognition and human signatures can be handled as an image and recognized using computer vision and neural network techniques.

With modern computers, there is need to develop fast algorithms for signature recognition. There are various approaches to signature recognition with a lot of scope of research. In here, off-line signature recognition & verification using neural network is proposed, where the signature is captured and presented to the user in an image format. Signatures are verified based on parameters extracted from the signature that using various image processing techniques.

This System accepted image of image and generate single output. That output can be single digit or pattern which containing binary values. Digital Image Processing and Artificial Neural Networks techniques are main techniques used for implement system.

According to the system DIP and ANN are two main parts in development side. When system accepts signature by image format and then its process using DIP. System gathered some unique features (Details) form Image and which use as input in ANN. In here for both Image processing and Artificial Neural Networks programming language based on C#.net with the help of *Aforge.net* computer vision library. Customized classes of *Aforge.net Imaging* library used for image preprocessing activities while all feature extraction activities algorithms implemented by using C#.net language. *Aforge Neuro* library used for ANN programming. Those two parts combined together and works as complete system.

Supervise training mechanism was used for train the neural networks, its contains 50 nodes in input layer, 10 nodes in hidden layer(s) and 1-5 nodes in output layer. Final output from output layer of ANN is use as unique ID to database for find out signature owner's details. Verification part extract whether relevant signature accepted or rejected.

Correct and Powerful feature extraction is directly affected to performance of the system. So many feature extraction methodologies are used for this system. Number of signatures which use for train ANN is also affects to performance. So here recommendation is use strong signature database.

This research showed that the Artificial Neural Network with Digital Image Processing techniques, able to recognition and verify hand written signatures with an acceptable accuracy level. Also system containing high False Rejection Rate (FRR).