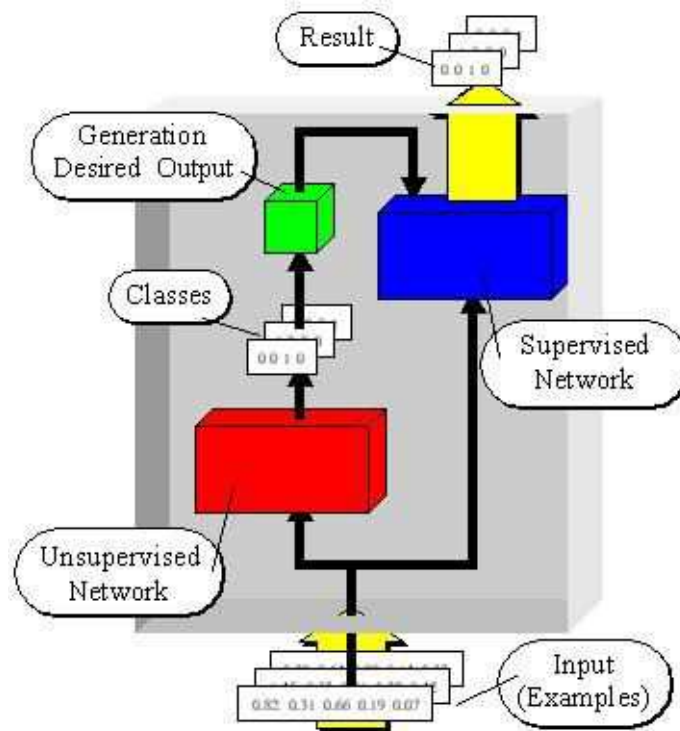# View-invariant action recognition based on Artificial Neural Networks

Abstract:

In this paper, a novel view invariant action recognition method based on neural network representation and recognition is proposed. The project has employed the technique mentioned and excellent results were obtained for a number of widely used font types. The technical approach followed in processing input images, detecting graphic symbols, analyzing and mapping the symbols and training the network for a set of desired Unicode characters corresponding to the input images are discussed in the subsequent sections. Even though the implementation might have some limitations in terms of functionality and robustness, the researcher is confident that it fully serves the purpose of addressing the desired objectives. The novel representation of action images is based on learning spatially related prototypes using Self Organizing Maps (SOM). Fuzzy distances from prototypes are used to produce a time invariant action representation. Multilayer perceptions' are used for action classification. The algorithm is trained using data from a various setup. An arbitrary number of images can be used in order to recognize actions using a Bayesian framework. The proposed method can also be applied to the depicting interactions between images, without any modification. The use of information captured from different viewing angles leads to high classification performance. The proposed method is the first one that has been tested in challenging experimental setups, a fact that denotes its effectiveness to deal with most of the open issues in action recognition.

Architecture:

Existing System:

View-invariant action recognition method it is not Support previous..Doesn't implement the MLP it is mainly to analyzing the angles.

Proposed System:

Inspired from this setting, novel approach in view independent action recognition is proposed. Trying to solve the generic action recognition problem, a novel view-invariant action recognition method based on ANNs is proposed in this paper. Action recognition results are subsequently combined to recognize the unknown action. The proposed method performs view independent action recognition; second MLP is proposed to identify the viewing angle. An emerging technique in this particular application area is the use of Artificial Neural Network implementations with networks employing specific guides (learning rules) to update the links (weights) between their nodes. Such networks can be fed the data from the graphic analysis of the input picture and trained to output characters in one or another form. Specifically some network models use a set of desired outputs to compare with the output and compute an error to make use of in adjusting their weights. Such learning rules are termed as Supervised Learning.

Advantage:

This experiment illustrates the ability of the proposed approach to recognize actions at high accuracy.

Modules:

1. **Artificial Neural Networks**
2. **The Multi-Layer Perceptron Neural Network Model**
3. **Optical Language Symbols**
4. **Region Maker for test region**

1. Artificial Neural Networks:

Modeling systems and functions using neural network mechanisms is a relatively new and developing science in computer technologies. The particular area derives its basis from the way neurons interact and function in the natural animal brain, especially humans. The animal brain is known to operate in massively parallel manner in recognition, reasoning, reaction and damage recovery. All these seemingly sophisticated undertakings are now understood to be attributed to aggregations of very simple algorithms of pattern storage and retrieval. Neurons in the brain communicate with one another across special electrochemical links known as synapses. At a time one neuron can be linked to as many as 10,000 others although links as high as hundred thousands are observed to exist. The typical human brain at birth is estimated to house one hundred billion plus neurons. Such a combination would yield a synaptic connection of 10^{15}, which gives the brain its power in complex spatio-graphical computation.

2. The Multi-Layer Perceptron Neural Network Model:

- It receives a number of inputs (either from original data, or from the output of other neurons in the neural network). Each input comes via a connection that has a strength (or *weight*); these weights correspond to synaptic efficacy in a biological neuron. Each neuron also has a single threshold value. The weighted sum of the inputs is formed, and the threshold subtracted, to compose the *activation* of the neuron (also known as the post-synaptic potential, or PSP, of the neuron).

- The activation signal is passed through an activation function (also known as a transfer function) to produce the output of the neuron.

3. Optical Language Symbols:

Several languages are characterized by having their own written symbolic representations (characters). These characters are either a delegate of a specific region, accent or whole words in some cases. In terms of structure world language characters manifest various levels of organization. With respect to this structure there always is an issue of compromise between ease of construction and space conservation. Highly structured alphabets like the Latin set enable easy construction of language elements while forcing the use of additional space. Medium structure alphabets like the Ethiopic (Ge'ez) conserve space due to representation of whole audioglyphs and tones in one symbol, but dictate the necessity of having extended sets of symbols and thus a difficult level of use and learning. Some alphabets, namely the oriental alphabets, exhibit a very low amount of structuring that whole words are delegated by single symbols. Such languages are composed of several thousand symbols and are known to need a learning cycle spanning whole lifetimes. ANSI and named the ASCII Character set. It is composed of and 8-bit encoded computer symbols with a total of 256 possible unique symbols.

4. Region Maker for test region:

After making the image from neural network, using region maker we have to cut the image as we want and note the cutting image Pixel.

Algorithm:
Action Recognition Algorithm

By using a 13×13 SOM an action recognition rate equal to 89:8% has been obtained. Table V illustrates comparison results with three methods evaluating their performance in the IXMAS multi-view action recognition database. As can be seen, the proposed method outperforms these methods providing up to 8:5% improvement on the action classification accuracy.

Hardware Required:

System   :   Pentium IV 2.4 GHz

Hard Disk   :   40 GB

Floppy Drive   :   1.44 MB

Monitor   :   15 VGA color

Mouse   :   Logitech.

Keyboard   :   110 keys enhanced

RAM   :   256 MB

Software Required:

O/S   :   Windows XP.

Language   :   c#.Net

Data Base   :   Sql Server 2005.