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A classification Of Multi Script Numerals Using Intelligent Agent.

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Abstract: This paper presents number recognition on new platform known as Net logo and to find the solution to the problem of number matching. This new Platform Net logo provides an environment which is agent based. Here the working is done by controlling the agents, and the recognition process is observed and by following the attributes of the agent's calculations for both the character is done. The main platform that is used in the project to develop the OCR system are the MYSQL, the java programming language and the Net logo. The important part of the agent based approach is the recognition of the character in any image by walking over the image and its implementation in Net logo. But the other two platforms are used so that the Net logo is supported.

Keywords:Mysql,Java,Net Logo,Number Recognition.

I- INTRODUCTION

Number recognition is the study of how machines can observe the environment, learn to distinguish Numbers of interest from their background, and make sound and reasonable decisions about the categories of the patterns Accuracy is achieved when typewritten characters is read. But OCR system for handwritten character can still be inaccurate. Therefore this recognition of character is still challenging part of the research area. On the basis of the collection of data and text type OCR is categorized. Machine learning is concerned for the computer algorithm development that is learned and it is an artificial intelligent branch. A wide range of task is learned and performed by the machine. From the two past decades one of the most important technologies is machine learning, and hence used in scientific domain of various types such as Robotics, Computer vision, theoretical computer science, recognition and optimization.By using the OCR technologies, the efficiency of the office work is increased, because in this technology the characters can be recognized from the image, which is an easy task then re-typing the text. Due to the advantage of this OCR technology it is used in a number of fields. There are two types OCR technologies on the basis of the input devices used:- On-line recognition and off-line recognition, In On-line method the data are collected by real time devices such as digitizer tablets. But in off-line method the data are collected from static devices such as scanners and cameras. Online recognition method allows the writing of information in real-time because of the concurrent data collection structure. But in case of Off-line recognition process few technologies are used for preparing the image for recognition process and it also removes the noise and errors of the input image caused during the collection process.

II- Preprocessing

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In this process texted part useful features are retained and the important information present in the image is discarded. To achieve this the image has to undergo a set of operation of preprocessing. And according to the image structure these operations arechosen. Some operations may be discarded or can be applied in different sequence. The recognition system has to be validated on the generated database as the standard database is not available at the moment.

III- Morphological Image Processing

Operations of morphological is based on the technique in which useful components of an image is being extracted such as convex hull or skeleton. A set of Robust is presented by the morphology which approaches to various problems of image processing. Among the various approaches one approach is Minkowski method.Minkowski method in the morphological operation is the process whereby using logical operation convolution is replaced. To process the image of an object they use element of structuring. The image interact with the structuring element which is a pattern for drawing a result that how this pattern gets filtered or misses in the region of the image. To reduce noise, smooth the region boundaries and artifacts they are used.

IV- Agent

An agent acts in an environment.An agent perceives its environment through sensors. The complete set of inputs at a given time is called a percept. The current percept, or a sequence of percepts can influence the actions of an agent. The agent can change the environment through actuators or effectors. An operation involving an effecter is called an action. Actions can be grouped into action sequences. The agent can have goals which it tries to achieve.

Thus, an agent can be looked upon as a system that implements a mapping from percept sequences to actions.

A performance measure has to be used in order to evaluate an agent.

A. Agent Performance

An agent function implements a mapping from perception history to action. The behavior and performance of intelligent agents have to be evaluated in terms of the agent function. The performance measureis a subjective measure to characterize how successful an agent is. The success can be measured in various ways. It can be measured in terms of speed or efficiency of the agent. It can be measured by the accuracy or the quality of the solutions achieved by the agent. It can also be measured by power usage, money, etc.

B. Intelligent Agents

An Intelligent Agentmust sense, must act, must be autonomous (to some extent),. It also must be rational.

C. Agent Environment

Environments in which agents operate can be defined in different ways. It is helpful to view the following definitions as referring to the way the environment appears from the point of view of the agent itself.

D. Presence of Other agents

Single agent/ Multi-agent A multi-agent environment has other agents. If the environment contains other intelligent agents, the agent needs to be concerned about strategic, game-theoretic aspects of the environment (for either cooperative *or* competitive agents).Most engineering environments do not have multi-agent properties, whereas most social and economic systems get their complexity from the interactions of (more or less) rational agents.

V- Methodologies of OCR

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The process of OCR follows the following steps

1. Preprocessing process
2. Segmentation process
3. Feature extraction process
4. Classification and Recognition process

Preprocessing:

In this process texted part useful features are retained and the important information present in the image is discarded. To achieve this the image has to undergo a set of operation of preprocessing. And according to the image structure these operations are chosen. Some operations may be discarded or can be applied in different sequence.

In this phase the important method performed are as follows:

A. Gray scale and Thresh holding method

Here gray level intensity is only carried by each pixel is converted into another form that is into gray scale format in order to extract background as well as foreground pixels.

Thresh holding is the process where i image of gray scale is converted into binary images. Thresh holding two main methods are as such adaptive global. In the thresh holding global method a constant value of threshold is used and then each pixel intensity is compared to the value of threshold. Ostu thresh holding method is used in wide applications tofindthe less value of Threshold. Image which require different value of Threshold for particular image region; adaptive thresh holding is very perfect for that image. Ni blocks method among the various method produce very appropriate value of Thresh holding.

B.Colour Image Processing

This process is mainly based on filtering of image. The process of image filtering is the method in which the pixels of an image are changed to create different kind of effects. Any pixel neighborhood uses the techniques of image filtering and convolution filters of any image. Any neighborhood pixels is made up of many pixels in series and which is connected to the another given pixel.

The process of convolution operation in which the selected pixel color values being get multiplied as well as its neighbor

by the help of convolution filters. The convolution filter another name is filter kernels, and are matrices of n*m, where n is the width of the filter n and m is the height of the filter.

C. Morphological operations Methods

some of the major process of Morphological operations are:

1. Erosion process
2. Dilation process
3. Skeletonisation process image.

1.Erosion process: The name suggests its operation is to erode away foreground pixel boundaries. Therefore as a result the foreground pixel size get reduced and the hole get expanded if present inside this region.

This process is applied with different algorithm as a elilation. The pixels which is selected is left as original when it is found that any item of the element of structuring get matched with the pixel of background, the value of pixel is set as the background value.

2.Dialation process: In the binary images the operation of dialation is applied in order to enlarge the foreground region of pixels boundaries. The operation of dialation for A which is a binary image by B.Where A_b is located at origin of b and

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the translation of A, Its main purpose is to bridge the gap as can be seen from the diagram. The element of the structuring origin is compared the image each pixel. If any item matches the structuring element from the foreground pixel which is one among the input pixels (the selected pixel neighbor) then the pixels which is being selected is set the value of foreground. But if the entire item matches of the element with that of pixels of background, then the pixel is set to the value of background.

VI- Methodology Used:

The main platform that is used in the project to develop the OCR system for number recognition; the three platforms are the MYSQL, the java programming language and the Net logo. These platforms are required so that the agent based approach is fulfilled. The important part of the agent based approach is the recognition of the character in any image by walking over the image and its implementation in Net logo. But the other two platforms are used so that the Net logo is supported.

Few steps are used in optical Number recognition and they are:

1. The image of the text documents is loaded by the user to the system with the help of java interface. The original text document is also loaded to the system for finding the result.

2. Few image processing algorithms is selected by the users from a number of options and works on the processing of image on the basis of the choices given in java.

3. When the processing of image in java is done then the pixel information is written by java (location and color) of the image that is processed to the "common.dat" document and then Net logo is run by java.

4. The agent-based approach is applied to the image by the Net logo after it reads the image information from the "common.txt" document. Each character is detected by the Net logo based on the results from the MYSQL database of the agent based approach.

5. All recognized text is written to the "Result.txt" by the Net logo when the recognition process is over.

6. The recognized text is read by the java from the "Result.txt".The rate of accuracy is found by making the comparisons between the original text which was loaded by the user and the recognized text. The rate of accuracy is found by applying few posts processing algorithm.

VII- Expected Outcomes

There are few results which gives information of the character; only when an agent's move over a character is completed.

The result which we get from the movement over the character is matched with all character features, to find out that to which character they belong, that's why a list is needed which is having features of all characters (e.g.:-edge count of characters); and is used in matching the result movement of Net logo. Next platform helps in storing the list of characters.

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