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Reduce the effort and time in calculating the absenteeism percentage of students using Internet of Thing (IOT) technology

Manhal Mohammad Basher Hasan Aga [1] and luay abdulwahid shihab [2, *]

[1] Northern Technical University, College in Mosul, Iraq.
[2] Department of basic science, college of nursing, university of Basrah, Basrah, Iraq.

Abstract

This study started from some of the problems that took from our institution a lot of time to solve, this study included two parts, and the first part is Image discrimination problems are usually difficult to solve using unprocessed data. to improve the discrimination process Characteristic extraction is often needed to represent data in a space of distinction. Pattern recognition aims to find or recognize specific patterns or structures in digital images (signal).

To identify a pattern or an object in an image, you must first obtaining direct preliminary and statistical information about the image that must be digital in order to be able to deal with it by computer. The information in the image must also be classified to facilitate subsequent operations on the image, such as Debriefing.

The second part is to calculate the absences of students with an electronic system based on two languages where VB.Net language was adopted to accomplish the program interfaces in addition to the special code to find the percentage of absences, SQL was adopted for the purpose of creating a database in the program and storing data. The process of finding a mechanism to link the VB.Net program with the Internet for sending an e-mail message to the person concerned with the program (the student) for informing the percentage of absences in the study materials when exceeded the ratio approved in the program. The program has also been linked to a local network to be used on more than one computer at the same time and on a single database.

Keywords: Image; SQL database; Internet of Thing (IOT); Network; Server Por

1. Introduction

Reducing the effort and time in calculating the absenteeism rate for students is necessary in the work of the teacher, in order to ensure the performance and sobriety of education, Along with the development of the present time people are required to proceed faster in all things because technology is developing so rapidly with various emerging innovations and their application, which greatly helps people's daily activities and the application of advanced technology is felt in all aspects, one of them in academic lectures aimed at facilitating the process of academic service, one of the uses of information technology is the lecture attendance system at universities. The existing attendance data is used as a reference to show the credibility of each student [1]. He industrial activities in the IOT started around the same time as the academia, though the corresponding products were very sparse the first several years [2]. The people trained in this profile should know about the business, computational tools, and statistical analysis and interpretation. Among the objectives of Information Science is to provide a means for making relevant information available to individuals, groups, and organizations involved with science and technology [3]. The useful key for using (IOT) in manage education process and the benefits which return for each one teacher and student which facilitate the education process. Determine the

* Corresponding author: luay abdulwahid shihab
Department of basic science, college of nursing, university of Basrah, Basrah, Iraq.

challenge, which face teacher and student through applying (IOT), And identify the readiness of high school in Basra to apply (IOT) through specify the challenge which facing them. The most important finding of the study was that most schools are not ready to implement (IOT) because they do not provide a connection for all students and the necessary device, lack of training [4]. Handwritten digit recognition despite being a well studied problem isstill an active topic of research. This problem is relevant for tasks like postalmail sorting or form data processing [5]. Image recognition problems are usually difficult to solve using unprocessed data. To improve the differentiation process, there is often[6]. used so-called artificial vision system to recognize Spanish car license plate numbers. This system is designed to be independent of the distance between the car to the camera, the size of the license plate, the inclination and the surrounding illumination conditions. Some other researchers used neural network and its variance for LPR [7].

Aim

The aim of the research is to find a suitable method for distinguishing Arabic numbers in digital images of all sizes and their forms, by studying the forms of Arabic numerals in different sizes and highlighting the most important points of convergence between these forms for each number By converting it into a data matrix that depends on the definition of rows and columns, to arrive at a formula that includes features or distinctive attributes that become a general basic rule that makes an effective contribution to be one of the ways to distinguish numbers.

2. Material and methods

This method is able to distinguish between digital images of Arabic numerals, even if those images appear under pictorial conditions different from the reference images or models

2.1. Primary treatment

The processing that is done on the image of numbers is the process of converting the color image to the two-color image, and that is Choosing the threshold value using the command (graythresh) and then executing the command (im2bw) in MATLAB. Then work Dilate the image once to improve the image by filling in the blanks in the image and defining the edges of the number with a link the broken lines and then make a thinning (thin) for the numbers in the image using the command (bwmorph) to remove redundant information and get the important information about the shape of each number:

```
c = Imread (name of file);
Level = Graythresh (c);
W = Im2bw (c,level);
Figure; Imshow (W)
W=Imcomplement (W); % to inverse color
W=bwmorph (W,'dilate',1);
 I= bwmorph (W,'thin',30);
```

2.2. Cut the number out of the picture

The mechanism used in the cutting process, "The proposed algorithm in The process of cutting the number plate "is in two stages: the first is the process of cutting the number plate from the image of the student.

The original part is based on the frame surrounding the number plate, The second stage is the process of separating each number from the image based on the blanks Separate the columns without bright spots from each other as the separator between the numbers in the image (ie the end of an image).and the beginning of another picture in succession for each number). Thus, each number was obtained separately in each picture.

2.3. *Analyzing the characteristics of Arabic numerals*

Each object in the picture has certain characteristics that can be discovered by identifying the edges of the object and then tracing its boundaries and then distinguishing these characteristics that pertain to each organism independently of the other.

The characteristics of each of the Arabic numerals were discussed in this research, where 10 types of Arabic numerals were studied number lines of different sizes (72, 36, 28) normal and dark and it turns out that these numbers are of various shapes and sizes

They are distinguished among themselves by similar characteristics, and to clarify the work, the types of lines in which the drawing of each number differed were included numbers. See Figure (1), which shows one type of number line, with a size of 36, in which the drawing of each number is different of numbers clearly as well as handwriting, and Figure (2) (clearly shows the difference in the forms of numbers after the process of slimming.

Figure 1 One type of number line, with a size of 36

Figure 2 Clearly shows the difference in the forms of numbers after the process of slimming

Table 1 The division of the image into 16 parts

Photo of the number after the cutting process	Divide the image into 16 parts
Binary form of a number image	

Where the student identified based on the number placed on the student's academic seat after the student database fed with the numbers and names of students, which facilitated the process of calculating students' absences without human intervention.

2.4. Visual Basic 2010

It is an easy language, but it is one of the most powerful languages programmatically as this language is one of the languages that have great advantages in visual design processes (graphical interfaces), also depends on this language in the development of its applications on objects is a modern language in terms of its dependence on Dynamic and events.

A set of interfaces has been adopted and designed for the purpose of introducing and dealing with the cases of student absences.

In the other windows, the names of the students entered, as well as the window for entering the study materials for all stages, in addition to the window of entering the ratios that adopted in equations to find the absentee ratios for the students.

Another feature of this system is the search, scanning and modification process the program can delete all information in the tables that is usually used at the beginning of the new school season. The security process used to erasing the contents of all tables done after typing the correct password. As well as the limitations of the program that the number of subjects introduced does not exceed (12) subjects. In addition, program used on the internal network, which allowed the use of the program on more than one computer in single database.

2.5. Data Base

With the great progress, that has taken place, the increase of information, there is a need for rules and tools to organize this flow of data, and the computer has the main role in this. SQL used in this system because through this language you can build a very strong database management system is not permeable by controlling the powers and permissions of users who deal with the database.

2.5.1. Linking the program to the international information network.

- With the tremendous development of information transmission networks and the spread of the Internet in the transmission of data between users and to gain confidentiality of information is of great importance.
- Connecting the more than users' computers to the program via the Internet in order for the data to be entered into the program simultaneously, as the program can accept information from more than one user at one time. This provides the flow of data entry in parallel for all the computers on which the program works
- A new feature has been added which includes informing the student of his absence rate through a message sent to the student's e-mail (this message is sent in case of exceeding a certain percentage approved in the program). This feature gave the program the advantage of informing the student of his absence rate even if he is not in the college or department. This facilitated the process of communication with the student and inform him in a modern way.

The proposed algorithm included a set of stages and the following is a summary of each of these stages:

Data entry stage

At this stage, the students' data, including names, stage and number of hours of absence are entered depending on the number in the image that is analysed in first part in this research

Treatment stage

At this stage, the percentage of student absences is calculated successively for all subjects and for all students and then stored in a special table containing the percentage of absences of students for all subjects.

Reporting phase

At this stage, reports are printed, including a table of students' names, subjects, and absenteeism.

Sending message

Sending data and transfer through the international information network to the student's e-mail.

3. Conclusion

Since the process of discrimination relied on entering the data represented by the distinctive characteristics of the image of each number, and it was completed Classification of data according to its similarity with data or models in the public database, so this method is one of the Recognition supervised methods.

The main objective of choosing properties is to find semantics through which to describe the image that could be a reference to classify a set of images. This step is an image coding mechanism by which the image can be described a specified number of unrelated semantics.

The proposed algorithm can be used in security systems for the protection of facilities to allow, for example, the introduction of authorized vehicles whose number has been marked to protected areas

The interfaces of the program require the user have experience with the work of the program and the data entered and how to extract reports also requires skill in how to modify the data when any error occurs in the entry process so that the results are correct as it is through practical application to find the percentage of absences for students The program was worked on by 3 users and at different working times according to the percentage of students' absences, which are determined by the faculty in the department. the process of sending absenteeism rates depends on a certain percentage of the number of students whose absence rates exceeded 3%, 7%, and 10%.

The transmission process is not depend on the user's control, but rather is done automatically, and reports are issued upon each transmission.

Future work

The percentage of absenteeism for students is calculated using face recognition methods (the student's face), as this process will provide accuracy and be automatically 100%.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

The present research work does not contain any studies performed on animals/humans' subjects by any of the authors.

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