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WRITING USING EYES TRACKING SYSTEM

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ABSTRACT

Eye-tracking writing program, the program provides very important assistance for people with speech and movement disabilities, and it is considered a humanitarian service program.
It has been worked on by a number of programs and platforms and the use of one of the important languages in the world of programming. It consists of two windows. The first is the camera to recognize the face and implement eye commands, and the other is the keyboard window and the method of working in a matrix form and moving the cursor in a regular manner around the letters and the words. The program works on the computer only, and one of its needs are the auxiliary programs to operate and the camera used is of good accuracy and also needs an average processor to be able to implement the instructions easily.
Keywords: *Eye-tracking; Writing; Educational Technology; Camera; Vision.*

1- INTRODUCTION

Only in our country there are about 1000 people who are completely paralyzed, immobile and incapacitated. Despite their mental activity, these people have no way of communicating with their environment and depend on the people they care about to be able to read their desires from their eyes or interpret them otherwise. In the context of previous developments, have shown that it is primarily possible to measure weak potential differences in eye contour. Thus, there is a possibility to use eye movements to fix signs and symbols on the screen and in this way to control a computer with connected peripherals. Thus, people with the most severe disabilities (the inability of the entire body to move with a simultaneous speech disorder) have a chance to break through the disease-related isolation again. Where you can connect to the environment via computer and take advantage of all the other benefits of a computer, such as: global online communication to your creative design ideas. Methods an EOG (electrocardiogram is a standard procedure for diagnosing dark coefficient healing, in which the potential field changes with the line of sight near the eyes. This effect can be used as a signal to control computers. A system with an EOG evaluation has been presented.

1-1 The Role of Educational Technology in Providing Solutions for People with Special Needs

The role of modern technology is to provide future visions, special educational services and programs, and innovative creative solutions to educational problems, which contribute to reformulating and designing the educational content provided to them in a way that helps them obtain information easily and easily, and in providing application, practice, training and actual experimentation through various educational practices. Design solutions: It is represented by taking into account the technical methods when designing and developing learning resources, programs and educational materials - produced or ready-made - that are compatible with the nature of this group of learners and their needs.

1-2 Obstacles of educational technology that used for people with special needs

There are some obstacles that prevent the optimal use of certain technological means for people with special needs, perhaps the most prominent of which is the speed of program development, which makes the disabled category far from catching up for a long time to benefit from the latest developments. Also, the high costs of equipping devices and technological tools adapted to the requirements of the type of disability may amount to a lot for special programs and costs of configuring the device. Some groups of people with special needs cannot bear these expenses even within developed, , and the obstacles to using educational technology for people with special needs can be divided into the following:-

1- The obstacles that prevent the optimal use of educational aids that relate to teachers with special needs.

2- The obstacles that prevent the optimal use educational aids related to people with special needs Misuse of devices by students with special needs when they use them alone.

3- The obstacles that prevent the optimal use of educational aids related to school administration for people with special needs the absence of a technician to operate and maintain educational equipment in the school or institute. The lack of adequate educational equipment and tools in the institute program. Textbooks are free of directives that affirm the necessity of using educational aids. Difficulty transferring some technological devices to classrooms.

1-3 Programming Language Python

A programming language is simply a code in which write instructions and instructions that tell the computer the tasks required these tasks that you request from the computer using the programming language and codes can create programs and games on the computer; Through codes, can also build a website and design way you want, or create applications smartphones, robots, and anything you can imagine on technological devices is implemented in programming languages and codes.

Python language characterized by ease of writing and reading and in terms of installation Grammar and you can program it in all the known platforms now, it is It is well established and suitable for almost all purposes. A vibration sensor is a device that measures the amount and frequency of vibration in a given system, machine, or piece of equipment.

1-4 Camera

one thing that cannot be dispensed with and which has even become one of the things that the largest smart phone companies compete their production. Everyone now has either an Android phone, an iPhone or a laptop. All things contain cameras, but those cameras have different capabilities. Some of them are able to photograph accurately.

2- DESIGN AND IMPLEMENTATION

The types of libraries are defined and used within the code. Writing important information, how it works, and interconnectedness within the code and application of the program

The program consists of two codes and they are as follows: -

2-1 Vision video

the definition of the CV2 library, which is considered the most important in the field of detection and tracking in the Python language. It has been used to locate and identify the location of the eye by the camera or the path of the camera installed in the device manager of the computer used to run the program. Using the time library, which is setting the start and end time for receiving the instruction and sending the instruction from the camera to the program for that library to execute it. The uses of this library are to determine the start and end time, response speed, and execution of the inside command. A capacitor is a device that stores electrical energy in an electric field. It is a passive electronic component with two terminals.

2-2 Eye Tracking Keyboard

As for the keyboard program, it contains a number of important definitions and libraries, the first of which is the OS library, and its work is limited to implementing and operating the program within the computer system. Then the mixer library is the array library for arranging and distributing letters and words within the execution window. And the last library is the cursor that moves in a regular way in the form of the keyboard and the implementation of the excursions by clicking in conjunction with the mouse.

2-3 Eye Tracking Software

Eye tracking software detects and tracks a person's eye position from an instant camera or video image, and uses a calibration sequence to map the tracked eye / pupil coordinates to positions on a computer screen or display. Note that the system uses cv2 for calibration, so the eye tracking source code is depends on a clear and darks image of the pupil. The system use regular high-definition cameras to locate the center of the eye and process the movements or instructions emerging from it. This makes the pupil more distinct and thus easier to track. The camera setup part in the program is designed to be as normal without any filter or programming effect. The main interface of the program consists of two windows the first window is linked with the camera to display the user, determine the eye, and respond to signals the second window displays the keyboard in a clapper form and the cursor is created using the counter method.

Figure (3-1) System Interface

3- CONCLUSION

This project had three goals: (a) review the literature on existing writing research methodologies, (b) describe the new writing methodology of the project, and (c) conduct a pilot study that demonstrated how project methodology could be used to investigate the use of writing in problem-solving. In this project review of existing writing research methodologies, and noted the strengths and weaknesses of each and described how the project could improve on each. The project also provides the fine-grained detail necessary for understanding the complex dynamics of those processes. There are still issues to be resolved in our methodology that could be able to address in the future.

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