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Writing Robot: a Review

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WRITING ROBOT : A REVIEW

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ABSTRACT:

People are increasingly relying on robots to complete their work because they are more adaptive, accurate, and trustworthy, while also requiring less human effort. Another significant task is to document the hard copy. People have recently become increasingly interested in developing a writing robot that can sketch, write, and perform other tasks. They have used a variety of strategies to achieve their goal. For example, input is supplied through a computer to sketch the paint on the wall, and another example is a voice-based writing robot to assist in several sectors such as tests and composing letters for various circumstances. This article will provide information on various types of robots and their applications.

1.INTRODUCTION:

Robots designed to help humans in their tasks and decrease human effort. Robots are now developed to imitate human behavior and do activities that humans do. A speech recognition writing machine is a novel concept that combines a pen writer with a voice sensor, allowing a person to make written notes without exerting continuous physical effort. The writing machine is a mechanical plotter that is used to write the characters after they have been recognised. Robotics is the study of the design, construction, operation, and application of robots, as well as the computers that control them, provide sensory feedback, and process information. The act of translating an acoustic signal acquired by a microphone or a telephone to a collection of words is known as speech recognition. With technical breakthroughs in the robotics area, efforts are being made in the study, design, and development of robots for many practical reasons.. Many research firms are working on building robotic arms that can perform fundamental human-arm activities. Writing abilities are one of the main functions.

Speech Recognition has two crucial components: i) recognising the series of sounds and ii) identifying the word from the sound. Many criteria influence this identification process,

including Speaking Mode, Speaking Style, Speaker Enrollment, Vocabulary Size, Language Model, Perplexity, Transducer, and so on. Speak Modes for voice recognition systems include one single word at a time (isolated-word speech) and continuous speech. The voice recognition system may be divided into two types based on speaker enrollment: speaker dependent and speaker independent. Speaker dependent systems must be trained before usage, whereas Speaker independent systems can recognise any speaker's speech based on vocabulary size and language model.

3. Literature Review:

3.1 Drawing Robots:

Duvsan, & Petrovic, et.al, has developed a Robotnačka [2003]

This is the first robot to be equipped with infrared modem.Users may operate the robots directly from the Imagine Logo programming environment, Java programmes, or any higher-level programming language by using the included DLL or ActiveX software component.

It is a very accurate mobile two-wheel differential drive robot controlled by a simple 8-bit microcontroller. It can be remotely controlled over BlueTooth radio connection from a workstation.Robotnačka has circular shape, 210 mm in diameter. The main board is made from the black plastic board 5 mm thick.

360 degrees is equivalent to 2880 steps and both motors rotate in opposite directions in the robot geometry (i.e. 8 steps per degree). Wheel span should be 180mm and diameter 50mm. It is important that the nib is exactly in the middle of the two wheels. The central processing unit is based on an Atmel AT89S8252 8-bit microcontroller running at 11MHz and drives both stepper motors with two he L293D full bridges.

3.2 Voice Control Robot using Android Application:

Dr.M.Narayana, Abhinay Alishety, et.al, [2015]

The purpose of this research is to provide a simpler hardware architecture for robots, but with a powerful computing platform that allows robot designers to focus on research and testing

rather than Bluetooth connectivity infrastructure. The AT89S52 is a high performance, low power, 8-bit CMOS microcontroller with 8K bytes of intrinsically programmable Flash memory.

This paper is to enable intelligent homes, more specifically home lighting control systems using Bluetooth technology. Robots and smartphones, especially mobile robots, are a perfect match. As phones and mobile devices become more powerful, they are used as robots to build robots with advanced capabilities such as speech recognition. Communication between his bluetooth enabled android phone and bluetooth module and bluetooth devices via HC-06. It concludes that the smart home will gradually become a reality, allowing consumers to control their homes remotely and wirelessly.

3.3 AUTOMATIC PEN WRITER WITH VOICE SENSOR:

Sunny Nahar and Reshma Laxman Katkar[2015]

Commands or voices from this user section are passed to the microcontroller section. The microcontroller then drives the plotter through the motor drives attached to it. A typewriter with voice access. Speech input from the User Section may initially contain speech or other types of commands converted to text or G-Code. This process is usually done using Google's speech-to-text converter.

A new sort of pen is on the way: an automatic pen writer with a voice sensor. A person can make written notes by employing this process without actively writing, which requires greater physical effort.

3.4 Compact and cost effective 3D Printer:

D. P. S. Pranav, D. Anil Kumar, I. Abhishek [2016]

They all implemented Stepper Motor drivers, PC Power supply, Arduino Uno, 3D Printing Pen & Filament, Various screws, nuts, standoffs, wires to create a cost effective and economical 3D Printer.

3D printing, also known as additive manufacturing or stereolithography Most Arduino boards come with varying amounts of flash memory, pins, and The MEGA 2560 is designed for more complex projects with 54 digital input/output pins, 16 analog inputs, a 16MHz crystal oscillator, USB port, power jack, reset button and large space for sketching.

3.5 Design and Development of Robotic Arm Generation-1:

Vaibhav Pawar, Sneha Bire, et.al, [2018]

This report describes the design and development of a robotic arm capable of performing simple tasks such as handling light materials. The robotic arm is designed and constructed from aircraft-grade aluminum material and uses servo motors to carry out arm movements. The robot arm design is limited to 4 degrees of freedom The robot arm design is complete. A prototype has been produced and its operation has been confirmed. This system will do it. It makes it easier for humans to deal with the unparalleled risk of handling questionable objects that can be dangerous in today's environment and workplace. This design allows you to perform complex and intricate tasks faster and more accurately.

3.6 HOMEWORK WRITING MACHINE:

Mr.R.Augustian Isaac, Amit Kumar Singh, et,al. [2018]

Servo motor with one string rod. Wood is a porous, fibrous host tissue found in the trunks and substrates of trees and other woody plants. It is a natural material, a characteristic composite of elongation-resistant cellulose threads inserted in a compression-resistant lignin lattice. Arduino is an open source personal computer gear and programming organization, task and customer network for building advanced gadgets and intelligent items that perceive and understand problems in a controllable physical and computerized world.

They design and manufacture single board microcontrollers and microcontroller units. Our products are provided as open source devices and programs, are licensed under the GNU

Lesser General Public License (LGPL) or GNU General Public License (GPL), and anyone can create Arduino sheets and distribute programs.

This commitment to homework toolboxes leads to providing fast numerical programming for display and control of homemaking machines. The various advances that have been made to create numerical models of do-it-yourself configuration machines are presented in an educational exercise using the delicate gripper case recently proposed on the network.

3.7 Design and Development of Voice Based Writing Machine for Alphabet:

J.Jenitta, Durga Prasad.V and Usha.M[2019]

Benbox is laser engraving software for CNC machines. Stepper motors, servo motors and other components make up the hardware part. It shows how to connect a stepper motor to his Arduino using the A4988 driver. The A4988 motor driver is a complete microstepping motor driver with built-in translator for easy operation.

They employed a robotic assembly in this suggested system to write the paper based on what the user says. This is accomplished through speech to text conversion and text to written document conversion. The suggested approach achieves an accuracy of 80%. The suggested system's accuracy can be increased in the future. The system may be expanded to do other duties such as select and place and other actions that will assist the disabled in their daily lives. Human help for changing paper sets can also be automated. The action of speech to text conversion can be performed by a separate hardware module.

3.8 AUTOMATED WRITING AND DRAWING MACHINE:

M Aditi, S Karpagam, B Nandini, and B S Murugan[2019]

This automated writing and drawing device is used to save time wasting. This DIY Arduino CNC machine can draw the most basic shapes, text and even cartoons. Arduino Board: The Arduino Uno is a microcontroller board based on the ATmega328. It delivers throughput close to 1MIPS per MHZ. Arduino's ultimate goal is to speed things up. It has 14 digital input/output pins (6 of which can be used as PWM outputs), 6 analog inputs, a 16MHz crystal

oscillator, a USB connector, a power jack, an ICSP header, and a reset button. . Operating voltage is 1.8 to 5.5 volts. Nowadays, more and more people are turning to robots to accomplish their work since robots are more versatile, accurate, and trustworthy, and they also minimize human efforts.

3.9 SPEECH TO TEXT CONVERSION USING ANDROID PLATFORM:

B Raghavendhar Reddy and E Mahender[2019]

Android is a software environment for mobile devices that includes an operating system, middleware, and core applications. Speech recognition in the Voice SMS application runs on Google servers using the HMM algorithm. Once the recognition process is complete, the user can see a list of possible statements. This process can be repeated by clicking the Image Button button. Press the most correct option and the selected result will be entered in the interface for writing her SMS message.

Over the years, designers have used speech in a broad range of applications, from mobile communications to automatic reading machines. The speech recognition technique decreases the overhead produced by other forms of communication. Due to the complexity and variety of speech signals and sounds created, speech has not been widely utilized in the fields of electronics and computers. However, using new current procedures, algorithms, and methodologies, these voice signals may be processed quickly and the text recognised. This study will create an online speech-to-text engine.

3.10 ARDUINO COMPUTER NUMERICAL CONTROL DRAWING MACHINE:

NEOH HOCK EE[2019]

3D printers can print three-dimensional objects after receiving the G-code from the computer. (2015) In his project, the L293D motor uses his driver to drive his DC motor, causing it to move along an axis. The A4988 motor driver was used in this project to drive the stepper motor. Hardware and software for CNC drafting machines. A 12V 20A power supply connected

to the CNC shield turned on the stepper motors and a USB cable connected to the Arduino Uno microcontroller board was used to power and send commands to the Arduino Uno.

The built CNC drafting machine successfully communicated with the software to perform the specified task. A G-code file image created with Inkscape software was successfully transferred to his CNC machine for drawing. The import and input images were successfully converted to gcode files and drawn by the CNC machine. Based on user feedback, drawing speed for CNC machines has been improved.

3.11 Voice Based Writing Machine Using Speech Recognition:

J.Jenitta, Roshan M.N, Sushmitha [2019]

The text is sent to the Arduino Uno via the HC-05's Bluetooth module. Text in digital form is continuously displayed on the Arduino's receive pin for further processing. When text is received at the Arduino's serial port, the code checks the alphabet and the motor control movement is determined based on a 26 letter match between the incoming text and the English alphabet.

From the starting position, the y-axis motor moves forward 4 cm and back 2 cm again, then the x-axis motor moves forward 2.5 cm, the y-axis motor moves forward 2 cm again and back 4 cm. Similarly, movement is controlled for the rest of the alphabet.

This proposed system used robot placement to create documents from what the user said. This process is done by converting speech to text and text to documents. In the future, we can also extend the proposed system to write all letters and numbers. The system can be implemented to serve additional functions such as pick and place and other activities that assist people with disabilities in their daily activities. Human assistance for changing paper sets can also be automated.A separate hardware module can be built to perform the speech-to-text conversion operation.

3.12 Research and Design of Writing Robot Based on Attitude Information:

Yan Yong[2020]

A commercial servo motor for this experiment has rotation angles between 0° and 270°. In this document, the Arduino 101 development board is chosen as the data classifier and the results are returned and sent to the underlying machine controller, the STM32 steering gear controller, to control the character writing of the mechanical arm. The classified results on the Arduino101 development board are sent to the STM32 via the serial port, which controls the rotation of the steering motor. The result of the Arduino 101 development board is sent to the STM32, which can drive the robotic arm in his 6 degrees of freedom to write letters.

In this paper, they mainly design the classifier module and the robot arm module by examining the handwriting of the robot arm. Acquire setting information using a 6-axis accelerometer, perform classifier learning and classification, and finally realize writing of characters. The shortcomings of conventional writing robots that rely on coordinate information and image information are compensated for by acquiring position information with a 6-axis sensor, improving the recognition rate. With the Arduino 101 development board controller, you can achieve classification and learning effects.

3.13 voice-accessible writing machine using Atmega microcontroller and ESP8266 Wi-Fi module:

Thanvi Fathim, Adhil Mohammed Jaffer,et,al[2020]

A speech-to-text engine can also improve the accessibility of your system. Provides data entry options for users who are blind, deaf, or have physical disabilities. An Atmega based microcontroller board. This microcontroller board contains 14 digital input/output pins and 6 analog pins. The G-code signal is sent to the microcontroller section via the Wi-Fi module. The WiFi module used here is the ESP8266 WiFi module.The operating range is 2.4GHz to 2.5GHz. The required operating voltage range for this module is 3V to 3.6V.

With this product, we can do paperwork and other tasks at the same time. Through this product, just by voting, the version is written on paper. people, who This product cannot use the direct pen and paper method. We know that time is very precious. Using this product saves time and human effort. It is flexible enough to be used in various fields. The proposed voice typewriter has high resolution, reproducibility, and error correction within limits.

3.14 Arduino Based CNC Drawing Machine:

Shubhan Agarwal, et,al.[2020]

CNC Plotter typically works with two CD-drives for Z and Y axes and one CD-drive for X axis, where the CNC PLOTTER plots the input which is given from the system from the drawing board using an open-source physical computing platform called Arduino Uno. The CNC PLOTTER has two CD-drive axis controls and one single CD-drive to lift and lower the pen. Each axis is given power and driven by using an Arduino Uno compactable driver A4988.

The paper states that the market for small machine tools is expanding significantly due to the growing need for small and large precision parts in many factories. Using small machine tools to manufacture small parts offers both flexibility and efficiency in manufacturing approaches and reduces capital costs. This is beneficial for small business owners. In this research, we are designing and analyzing a small-scale 3-axis "CNC-PLOTTER" with a very small budget.

3.15 Drawing Robot:

Raut Madhuri,et,al.2020]

These technologies are used to create machines that can replace humans and replicate human behavior. In robotics waterways, 2D sketch robot plotters are used, robots provide work built on CNC principles, and focus on a variety of applications such as cutting, grinding, electronic component manufacturing, and drawing.

Three L293D motor driver shields are connected to the Atmega328 microcontroller to port B and port D. Port B is a bi-directional port with a pull-up resistor and is connected to the input of the first motor driver shield. The motor driver shield is connected to the Arduino`s crystal oscillator and interrupt.

The Arduino based XY drawing robot, powered by the Atmega 328 microcontroller, is used on Arduino boards to quickly and efficiently draw any drawing or image that can be obtained from a source, specified as an input (SVG). scalar vector graphics format. converted. The input is fed to the input port of the microcontroller. A stepper motor is used to adjust the position of the pen to the origin, and a servo mechanism is used to lift it and display the output on paper. So you can easily paint important pictures in a short amount of time.

4.Summary:

A voice typewriter is a new concept that includes a voice recognition pen that allows you to create handwritten notes without constant physical effort. A typewriter is a mechanical plotter used to write letters after recognizing them. The main goal of this project is to build a language-based plot engine that writes on behalf of humans more accurately, error-free, and much faster than human speed.

5.Conclusion

From the above review, we can conclude that writing robots are feasible and These projects assist physically challenged persons in writing tests on their own. We can avoid a shortage of scribes due to heavy paper work by using this method, and we can also keep them independent. It also allows blind persons to assist themselves during exams without the assistance of a third party. It also helps in different documentation.

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