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SPEAKING SYSTEM TO MUTE PEOPLE USING HAND GESTURES

Ms.D. Venkata lakshmi[1], A. Manasa[2], D. Manaswini[3], M. Ravi teja[4], M. Kiran[5]

Asst.Professor[1], Student [2], Student [3], Student [4], Student [5]

Electronics and Instrumentation Engineering,

Lakireddy Bali Reddy Collage of Engineering, Mylavaram, India

Abstract: The primary goal of the project is to enable communication between mute and non-mute people using a Raspberry Pi and the programming language Machine Code. This initiative will be helpful in resolving the issue that persons who are deaf cannot speak and ordinary people cannot read sign language. We developed a smart speaking system that enables deaf people to interact with hearing people through the use of hand gestures and movements. Mute persons will be able to communicate via hand signals, often known as sign language. The Raspberry Pi serves as the project's primary tool, receiving input signals from flux sensors and processing them continuously. Here, the resistive sensor is also used to describe the flux sensor. When the message is located in memory, it is read aloud through the interfaced speaker.

Moving your body to communicate particularly of hands and arms used to convey their emotions. The WHO estimates that 466 million people worldwide have hearing impairments, or over 5% of the world's population, of which 34 million are children. In contrast, 18 million individuals in India suffer from hearing loss.

Index Terms **- Introduction, hardware tools, proposed system, Working, Results & Discussion, References.**

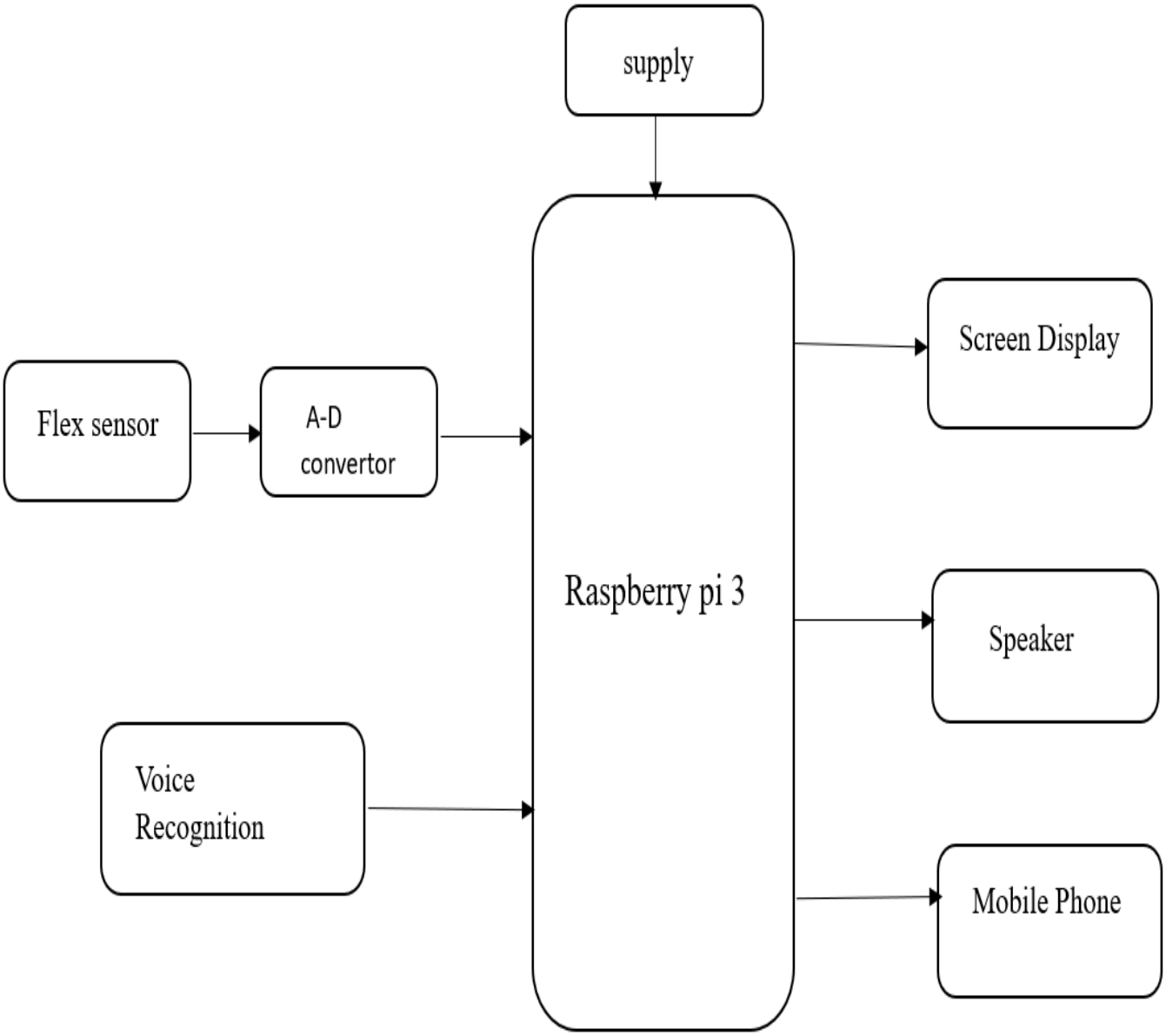
I. INTRODUCTION

we will provide an overview of embedded systems, including their application domains and their use in a project context. An embedded system is a computer system that combines hardware and software in order to perform a specific task. Common components found in embedded systems include microcontrollers and microprocessors. Microprocessors are often referred to as "general-purpose processors" because they simply accept inputs, process them, and output the results. In contrast, a microcontroller is capable of not only accepting data as inputs but also manipulating, interfacing, controlling and producing the desired outcome. Embedded systems are used in a wide range of application domains, from consumer electronics and automotive systems to medical devices and aerospace technology. They can be found in everyday products such as televisions, smartphones, and home appliances.

II. HARDWARE TOOLS

The tools we used while making this project are: 1. Flex Sensor, 2. Accelerometer, 3. Power Supply, 4. Raspberry pi3, 5. LCD Display, 6. MCP3208, 7. Speaker. Flex sensor plays a major role in the system, it is a sensor which measure the resistance when it bends, flex sensor resistance is directly proportional to the angle measure, sensor output is analog form. Accelerometer is an electronic device which is used to measure the acceleration force/measure the movement. It as three modes x, y, z. This sensor only capable of running onr of these modes at a time and it is used to measure the wrist spins. A 5V source of energy with a minimum current of 2.5A is required for the Raspberry Pi, while larger currents can be needed for some versions or for utilising particular peripherals. Usually, a micro-USB or USB-C port on the Raspberry Pi is utilized to connect the power supply. Raspberry pi is a low cost, credit-card sized computer that plugs into a computer monitor or tv, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to programming languages like python. A Raspberry Pi can be connected to an LCD monitor to give the user a graphical user interface. Since the Raspberry Pi lacks a built-in display, an external monitor must be connected in order to view the device's output. One solution for a portable, low-power display is an LCD display. Microchip Technologies produces the Analog-to-Digital Converter (ADC) integrated circuit (IC) type MCP3208. The MCP3208 ADC converts analogue signals into digital signals for use in a range of applications. It has 8 channels and 12-bit resolution. Speaker is used to convert electrical signal to audio signal.We get the required voice output by speakers

III. PROPOSED SYSTEM



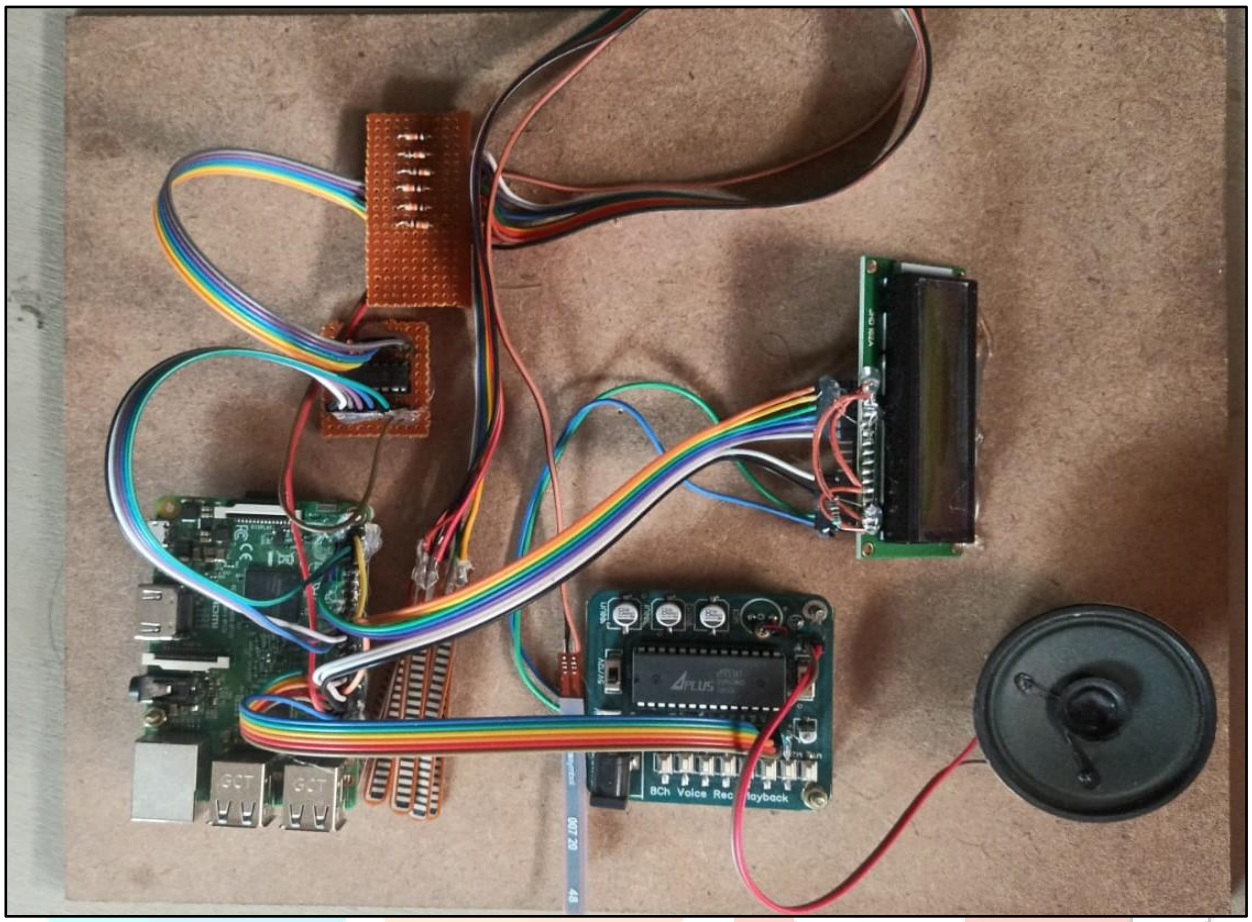
IV. WORKING

Communication systems for individuals who are unable to speak often use a combination of hardware and software components to allow the user to communicate using sign language or other hand gestures. Initially, a tool such as a camera or sensor is used to detect and identify the user's hand gestures. This can be achieved by computer vision algorithms that analyse the video stream or sensor data and identify specific motions. After the system recognises a gesture, it is then translated into speech or text using natural language processing (NLP) algorithms that can interpret gestures into spoken or written language.

The translated output is usually either heard through a speaker or displayed on a screen based on the user's preference. The system must also provide feedback to the user to indicate that their gesture has been correctly identified and translated. This can be achieved through visual or auditory cues, such as flashing lights or beeps.

The system requires advanced machine learning algorithms to recognise and interpret hand gestures in real-time, as well as a comprehensive collection of hand gestures and their meanings. Additionally, it should be designed to be user-friendly with clear instructions and feedback to allow the user to communicate effectively and accurately.

V. RESULTS AND DISCUSSION



The output of a hand gesture-based speaking system for mute people would probably be some kind of auditory or visual communication that conveys the message being conveyed by the hand gestures. The output could take a number of different forms depending on the particular technology employed, includingA computer-generated voice that instantly speaks the sentences that go with the hand motions.A visual display that corresponds the hand movements with text or graphics.A variety of outputs, both audible and visible.In any event, the output would try to translate the hand signals into a language that those who don't know sign language or other non-verbal communication techniques employed by the mute may comprehend. We have advanced communication, increased social engagement, and encouraged independence. This technique can help mute people express themselves more clearly, participate in social activities, and communicate their thoughts and feelings without the assistance of others. It can also be affordable, making it a feasible choice for people and organisations with limited financial means. It is also accessible to everyone, regardless of hearing ability. Overall, a speaking system based on hand gestures can enhance the quality of life and social inclusion of people who are deaf or mute, and it is an original and worthwhile approach to communication technology.

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