Reading Assistant for Blind People using Artificial Intelligence

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Abstract:- **Good vision is a precious gift but unfortunately loss of vision is becoming common now days. To help the blind people the visual world has to be transformed into the audio world with the potential to inform them about objects aswell as their spatial locations. Objects detected from the scene are represented by their names and converte to speech. Everybody deserves to live independently, especially those who disabled, with the last decades, technology gives attention to disabled to make them control their life as possible. The project provides alert system through buzzer. Blind stick uses IR sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles, the sensor passes this data to microcontroller. If the obstacle is close the microcontroller sends the signal to sound a buzzer.**

Keywords- yolo (you once live once) technique, open cv (open computer vision), espeak, infrared sensor, gyro sensor
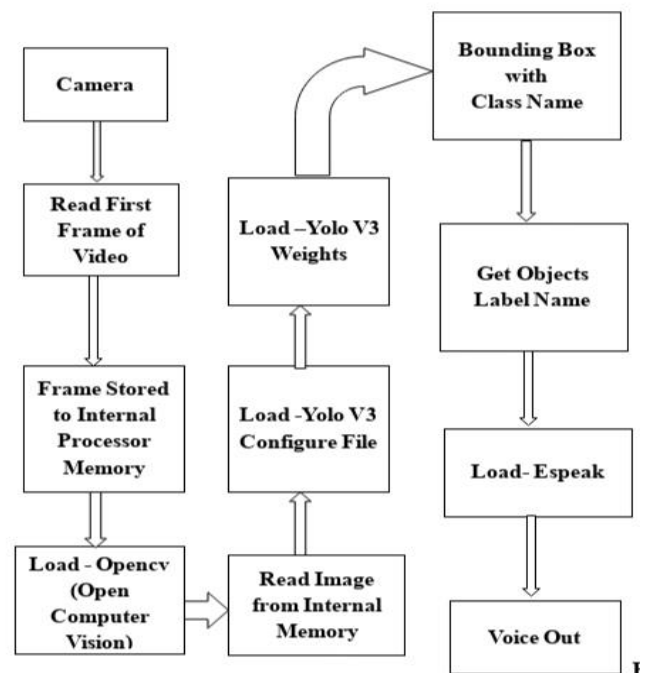
I. INTRODUCTION

One of the major daily problems encountered by visually impaired people is unsafe mobility. They fail to detect and avoid obstacles in their path, thus causing them emotional suffering, undercutting their independence, and The IR Sensors are positioned in the front, left and right direction to gather information of obstacles presentin any direction and revert back accordingly. Mud or water can be sensed with a moisture sensor and MQ2 Gas Sensoris used to detect any presenc of smoke or gas in the surrounding, immediately informing the user regarding the forthcoming dangers. If any kind of barrier is sensed by whichever sensor, the sensor sends the data to the microcontroller unit BLOCK DIAGRAM or the Arduino.exposes them to injuries. Recent World Health Organization (WHO) statistics show that there are approximately 253 million individuals around the world who are visually impaired. There are 217 million individuals with vision impairment, while 36 million people are blind. The visual impairment is turned into a matter of great BLOCK DIAGRAMconcern as the number of visually impaired people tends to increase by 2 million per decade. The number of

blind people is estimatedto double by 2020. People with vision impairment and vision ailments need help to perform day-to-day tasks, such aswalking and exploring unfamiliar environments.In the Sensing Module with Arduino as the microcontroller we have used Ultrasonic Sensor and IR Sensorsat different positions so that it can properly detect the obstacles. Ultrasonic Sensors can sense even the farther objects along with the distance measurement their research. work in leading journals to complete their grades. In addition, the published research work also providesa big
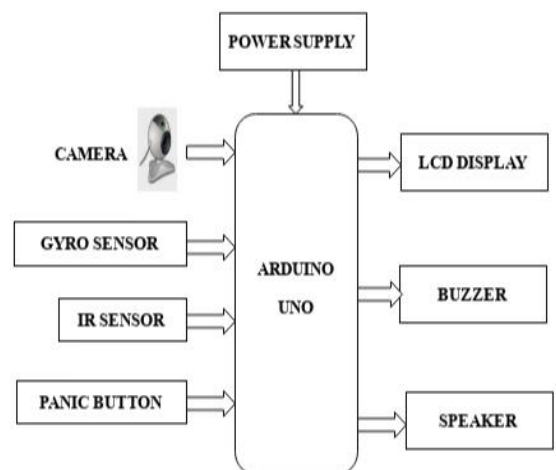
weight-age to get admissions in reputed varsity. Now, here we enlist the proven steps to publish the research paper in a journal.

BLOCK DIAGRAM;

diagram

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WEB CAMERA

A webcam is a video camera that feeds or streams its image in real time to or through a computer-to-computernetwork. When "captured" by the computer, the video stream may be saved, viewed or sent on to other networks via systems such as the internet, and email as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there.

MICROPROCESSOR

The processor is a chip or a logical circuit that responds and processes the basic instructions to drive a particular computer. The main functions of the processor are fetching, decoding, executing, and write back the operations of an instruction. The processor is also called the brain of any system which incorporates computers,

OPENCV

Open Source Computer Vision Library' initiated by some enthusiast coders in '1999' to incorporate Image Processing into a wide variety of coding languages. It has C++, C, and Python interfaces running on Windows, Linux, Android and Mac. Officially launched in 1999 the Open CV project was initially an Intel Research initiative to advance CPU-intensive applications, part of a series of projects including real-time ray tracing and 3D display walls.

YOLO V3

YOLO V3 is an incremental upgrade over YOLO V2, which uses another variant of Dark net. This YOLO V3 architecture consists of 53 layers trained on Image net and another 53 tasked with object detection which amounts to 106 layers. While this has dramatically improved the accuracy of the network, it has also reduced the speed from 45 fps to 30 f

ESPEAK

It is a free and open-source, cross-platform, compact, software speech synthesizer. It uses a formant synthesis method, providing many languages in a relatively small file size. Much of the programming for eSpeakNG's language support is implemented using rule files with feedback from native speakers.

HARDWARE;

POWER SUPPLY;

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

ARDUINO UNO;

Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

IR SENSOR;

An infrared sensor circuit is one of the basic and popular sensor modules in an electronic device. This sensor is analogous to human's visionary senses, which can be used to detect obstacles and it is one of the common applications in real time. This circuit comprises of the following components. LM358 IC 2 IR transmitter and receiver pair. Resistors of the range of kilo ohms.

GYRO SENSOR;

A gyro sensor, angular rate sensor or angular velocity sensor is a device that can sense angular velocity. Gyro sensors can sense rotational motion and changes in orientation and therefore augment motion. Vibration gyro sensors can sense angular velocity due to the Coriolis force which is applied to a vibrating element.

SPEAKER;

Speakers are one of the most common output devices used with computer systems. Regardless of their design, the purpose of speakers is to produce audio output that can be heard by the listener. Speakers are transducers that convert electromagnetic waves into sound waves. The speakers receive audio input from a device such as a computer or an audio receiver. This input may be either in analog or digital form.

PANIC BUTTON;

A push button switch is a small, sealed mechanism that completes an electric circuit when you press on it. When it's on, a small metal spring inside makes contact with two wires, allowing electricity to flow. When it's off, the spring retracts, contact is interrupted, and current won't flow.

BUZZER;

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.
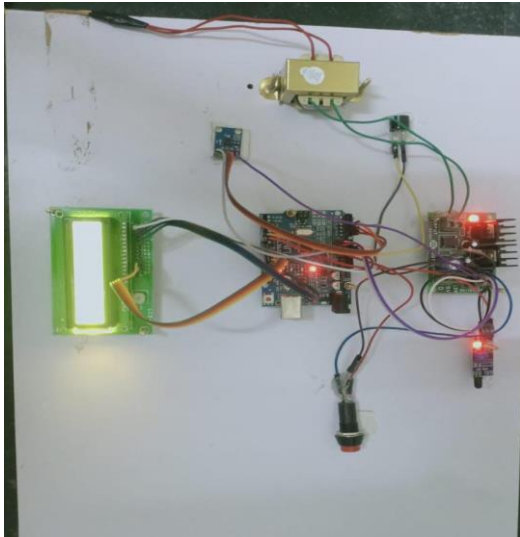
LCD CRYSTAL;

A liquid-crystal display (LCD) is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly

CONCLUSION;

The project started with the motivation and the idea to solve the problems of visually impaired people. Many methods were found to implement object detection and the usage of Open CV Library and YOLO was the best choice. we present a visual substitution system for blind people based on object recognition in frames. This system uses Yolo configuration ,weights and features matching for object identification. We devote the experimental part to test the application in order to detect some objects in some frames with different conditions.

FUTURE ENHANCEMENT;

In the future, the development of an Application Specific Integrated Circuit (ASIC) with the functionalities of the developed walking guide can reduce the size, weight and cost of the prototype. Semantic pixel-wise segmentation of the surroundings may contribute to categorize obstacles in the environment.

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