BHARATI VIDYAPEETH COLLEGE OF ENGINEERING,

NAVI MUMBAI

A report on

NAVIGATOR FOR VISUALLY IMPAIRED PERSON

For

Major Project I (REV-2019 'C' Scheme)

of Final year, (BE SEM – VII)

In

Electronics & Telecommunication Engineering

Submitted By

1. Nikhil Kanitkar A(23)
2. Dewoo Kudtarkar A(27)
3. Mandar Naik A(40)
4. Pranit Patil A(48)

Guide By

Prof. S.S. Patil

2022-2023

4. PROPOSED SYSTEM

4.1 ALGORITHM & FRAMEWORK

The YOLO framework (You Only Look Once) deals with object detection differently. It takes the entire image in a single instance and predicts the bounding box coordinates and class probabilities for these boxes. The biggest advantage of using YOLO is its superb speed – it's incredibly fast and can process 45 frames per second. YOLO also understands generalized object representation.

The YOLO algorithm is important because of the following reasons:

1. Speed: This algorithm improves the speed of detection because it can predict objects in real time.
2. High accuracy: YOLO is a predictive technique that provides accurate results with minimal background errors.
3. Learning capabilities: The algorithm has excellent learning capabilities that enable it to learn the representations of objects and apply them in object detection.

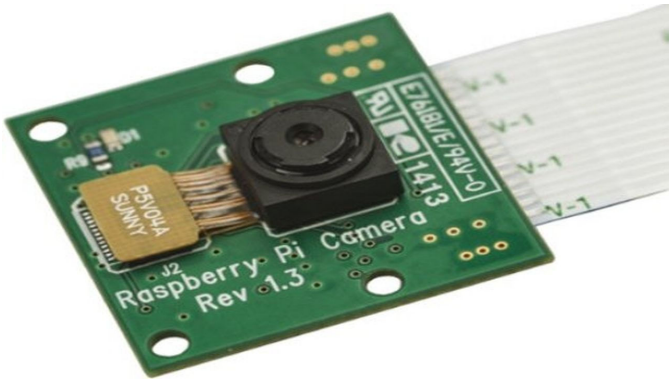
4. PROPOSED SYSTEM

4.2 DETAILS OF HARDWARE

Raspberry pi Zero 2W model: Raspberry Pi Zero 2 W is perfect for IoT projects this raspberry pi has a 1GHz quad-core 64-bit Arm Cortex-A53 CPU processor and 512MB SDRAM RAM and it supports 2.4GHz 802.11 b/g/n wireless LAN, Bluetooth 4.2, Bluetooth Low Energy (BLE).

It has a Mini HDMI port, micro USB ports, and also having CSI-2 camera connector.

Raspberry PI Camera module: This Raspberry PI Camera Module is a custom-designed add-on for Raspberry PI. It attaches to Raspberry PI by way of one of the two small sockets on the board's upper surface.



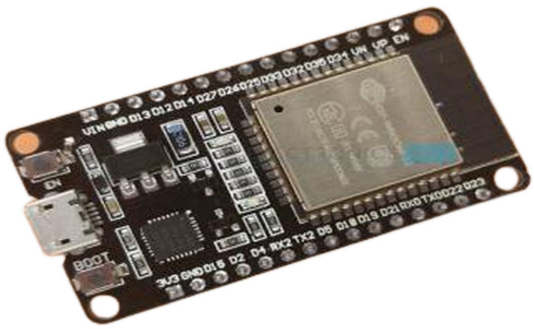
This interface uses the dedicated CSI interface, which was designed especially for interfacing with cameras. The CSI bus is capable of extremely high data rates. The 5MP camera module is perfect for small Raspberry PI projects.

4. PROPOSED SYSTEM

4.2 DETAILS OF HARDWARE

Earbuds: Earbuds are a pair of small loudspeaker drivers worn on or around the head over a user's ears. We are using advanced Bluetooth 5.1.

ESP32: ESP32 Development board is based on the ESP WROOM32 WIFI + BLE Module. It's a low-footprint, minimal system development board powered by the latest ESP-WROOM-32 module and can be easily inserted into a solderless breadboard.



Including the USB-UART bridge, reset- and boot-mode buttons, LDO regulator, and a micro-USB connector.

4. PROPOSED SYSTEM

4.2 DETAILS OF HARDWARE

Ultrasonic sensor (HC-SR04): This ultrasonic sensor module can be used for measuring distance, object sensors, motion sensors, etc.

The high-sensitive module can be used with a microcontroller to integrate with motion circuits to make robotic projects and other distance, position & motion-sensitive products. Detection distance: 2cm – 400cm (0.02M - 4.0M).

Vibrator Motor: Vibrator Motor is a shaftless vibration motor that is fully enclosed with no exposed moving parts. Its small size (10 mm diameter, 3.4 mm height) and shaftless design mean you can mount it on a PCB.

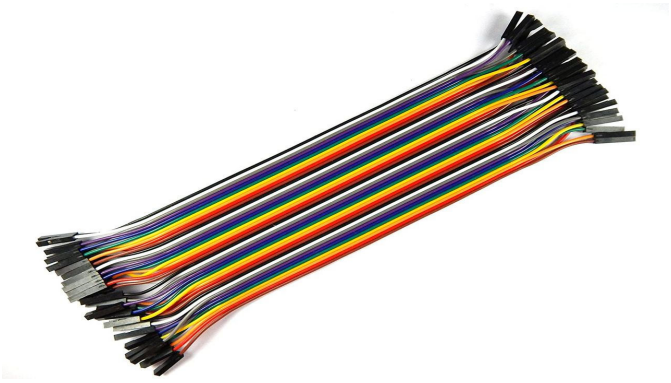
This tiny, button-type, vibrating motor shakes with a vibration amplitude of 0.75g and draws approximately 60mA when 3V is applied to its leads.

4. PROPOSED SYSTEM

4.2 DETAILS OF HARDWARE

Power bank: We are using a power bank to power up the raspberry PI and ESP32 both on an operating voltage of them and it is rechargeable.

Wires: We are using single-strand wires for connecting the components.



4. PROPOSED SYSTEM

4.3 DETAILS OF SOFTWARE

Visual Studio Code: Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux, and macOS.

Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

Users can change the theme, keyboard shortcuts, and preferences, and install extensions that add additional functionality.

Thonny: Thonny is an integrated development environment for Python that is designed for beginners.

It supports different ways of stepping through the code, step-by-step expression evaluation, detailed visualization of the call stack, and a mode for explaining the concepts of references and heap.

4. PROPOSED SYSTEM

4.3 DETAILS OF SOFTWARE

Jupyter Notebook: Jupyter Notebook (formerly IPython Notebook) is a web-based interactive computational environment for creating notebook documents. Jupyter Notebook is built using several open-source libraries, including IPython, ZeroMQ, Tornado, jQuery, Bootstrap, and MathJax.

A Jupyter Notebook document is a browser-based REPL containing an ordered list of input/output cells which can contain code, text (using Markdown), mathematics, plots and rich media. Underneath the interface, a notebook is a JSON document, following a versioned schema, usually ending with the ".ipynb" extension.

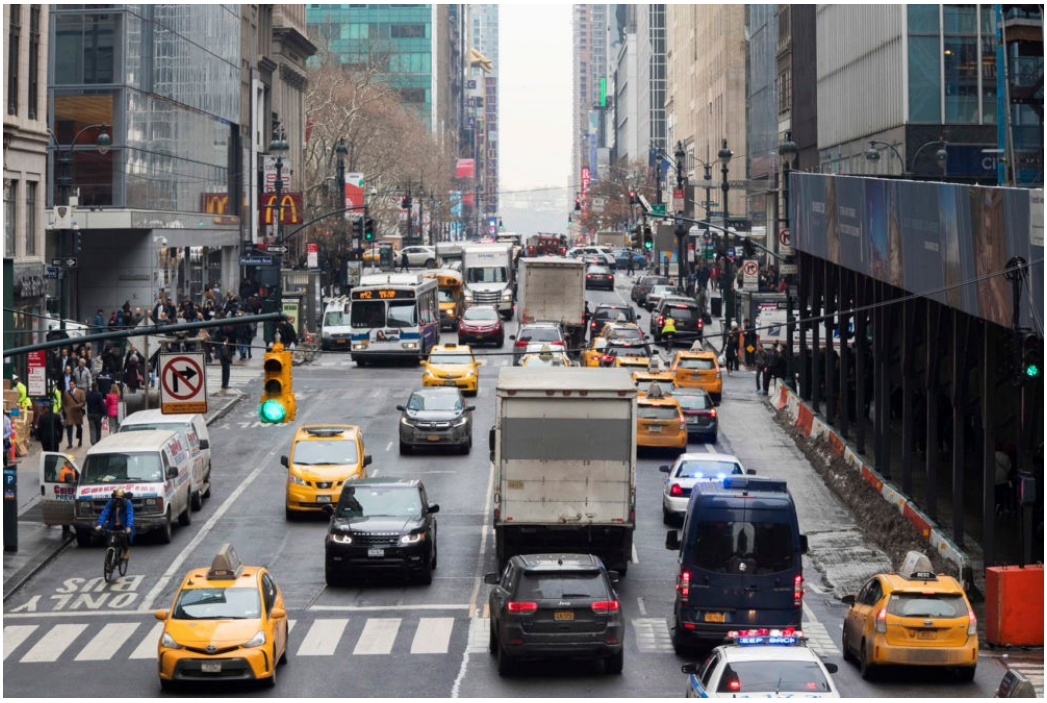
Github: GitHub, Inc. is an Internet hosting service for software development and version control using Git.

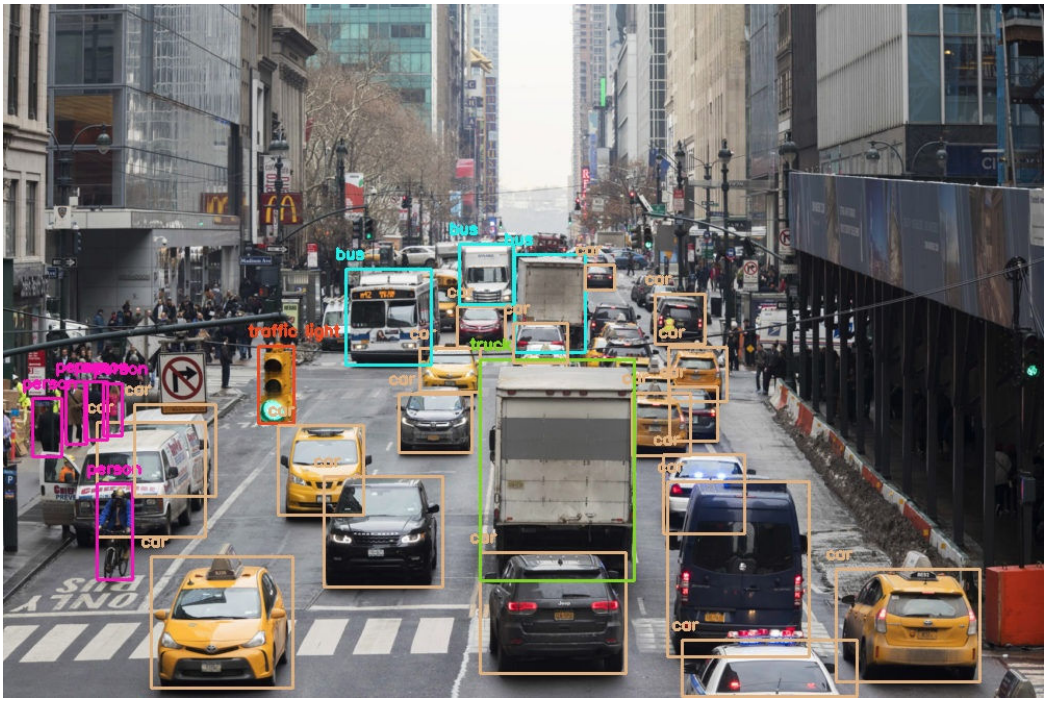
It provides the distributed version control of Git plus access control, bug tracking, software feature requests, task management, continuous integration, and wikis for every project. Headquartered in California, it has been a subsidiary of Microsoft since 2018.

4. PROPOSED SYSTEM

4.4 METHODOLOGY

4.4.4 OUTPUT





Github: https://github.com/mandarnaik016/YOLO-for-NAVI