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ATHARVA COLLEGE OF ENGINEERING

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Paper id (easychair id):___	Author s Name :
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Paper Title:	Voice Enabled Smart Assistive Device for the Visually Challenged
PDFeXpID:	PDFeXpID6341069

PRESENTATION FLOW

- **Abstract**
- **Problem Definition/ Objective**
- **Introduction**
- **Literature Survey**
- **Theory (Proposed work/Implementation/Algorithm etc.)**
- **Results and Discussions**
- **Conclusion/Future Scope**
- **References**

ABSTRACT

- The **World Health Organization** (WHO) Fact reported that there are **285 million** visually-impaired people worldwide. Among these individuals, there are **39 million** who are blind in the world. Unfortunately, all these numbers are estimated to be doubled by 2020.

- In this high tech era, technology has made it possible for everyone to live a comfortable life. But somehow the physically challenged people need to **depend upon others** in their daily life which ultimately makes them less confident in an unfamiliar environment.

- So, in this project, an **intelligent device** is represented, which is an amalgamation of various technologies, for the visually challenged people to help them travel around the college and similar premises safely without facing any difficulties and needing human help.

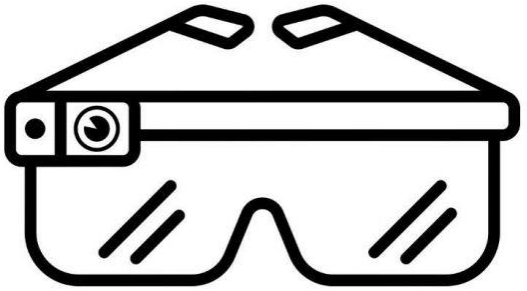
PROBLEM DEFINITION

To create an assistive device for visually impaired people which will let them get a better sense of the surroundings and environment of our college and similar premises and also give them audio feedback regarding the obstacles. The device can also classify the nearby objects and give a basic idea to the user about the object either by voice commands. The device can be fully operated by voice commands for easy usage.

OBJECTIVES

- Build a device for travelling safely around the campus
- Overcome Environmental Challenges
- Overcome Technological Challenges
- Overcome Social Challenges

INTRODUCTION



- In our project we present the modeling, implementation and testing of an experimental **microcontroller**(MCU) based **smart assistive system** which can be used by the **visually impaired**.

- This device includes **audio** feedback options
- An easy to use **Android App** will also help the user set up the device during its first run or else the device will run using its default settings as it would be capable to **work independently** without requiring a smartphone to operate.

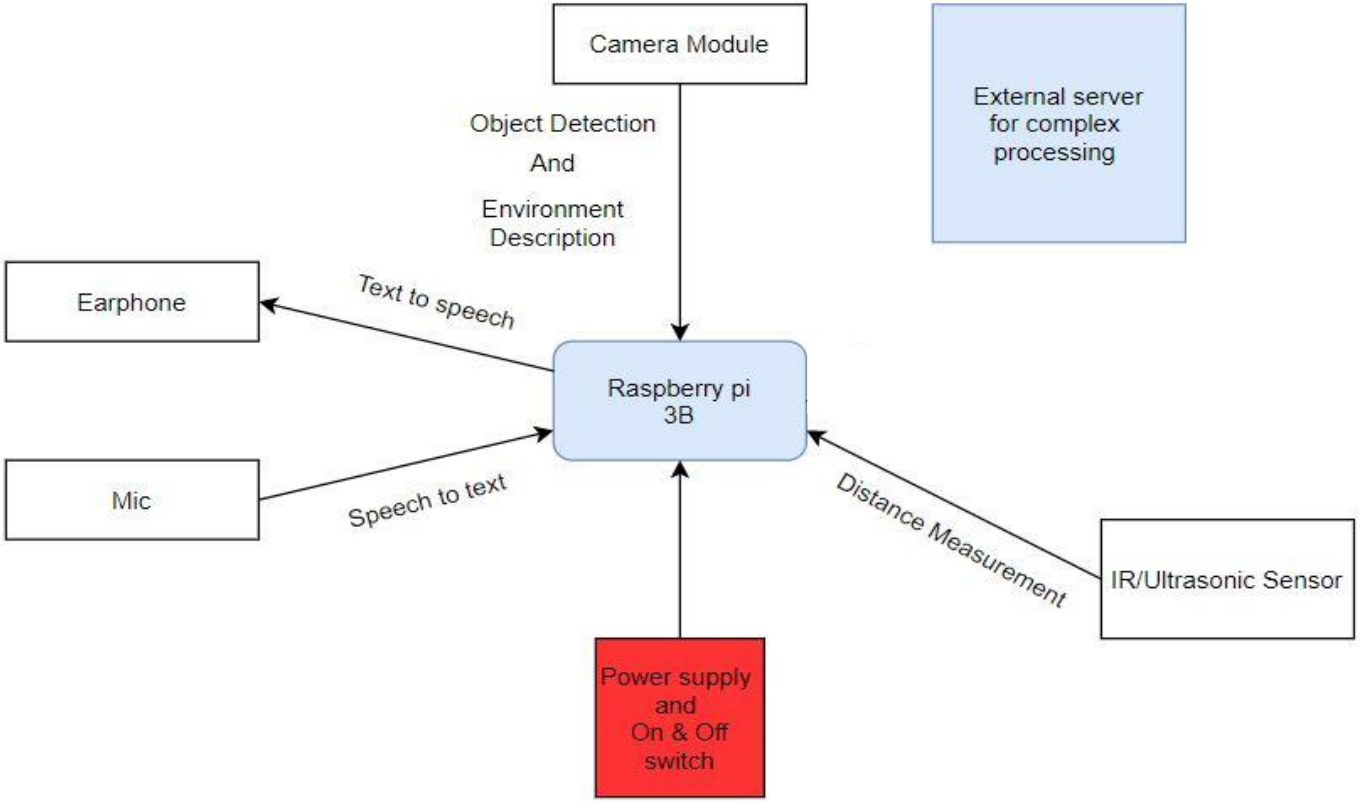
Literature Survey

Sr No.	1
Title/Author	Chang, Y.-H., Sahoo, N., & Lin, H.-W, "An intelligent walking stick for the visually challenged people." in 2018, IEEE ICASI 2018- Meen, Prior & Lam (Eds)
Method used	Ultrasonic sound reflection (using ultrasonic sensor) Water detection (using water sensor)
Advantage	Location Tracking
Disadvantage	Cannot be used without the app. No Audio Feedback.
Extracted Methodology	The system has experimented inside their campus and the result is that the obstacles are detected in time, the difference between the real and recorded distance varies only 2 to 3cm.

Sr No.	2
Title/Author	Munteanu, D., & Ionel, R., "Voice-controlled smart assistive device for visually impaired individuals" in 2016,12th IEEE International Symposium on Electronics and Telecommunications (ISETC)
Method used	Ultrasonic sound reflection (using ultrasonic sensor) Audio commands and feedback
Advantage	Voice commands could be used
Disadvantage	Indicates only the distance of object, no other information about object
Extracted Methodology	The most accurate results were obtained with flat surfaces as obstacles at an angle of maximum 30˚ from horizontal. Surfaces with irregular shapes can reflect the signals in the vicinity of the ultrasonic sensor and the results of the measurement can be erroneous. This shortcoming can be suppressed by moving the hand both in the horizontal and vertical planes.

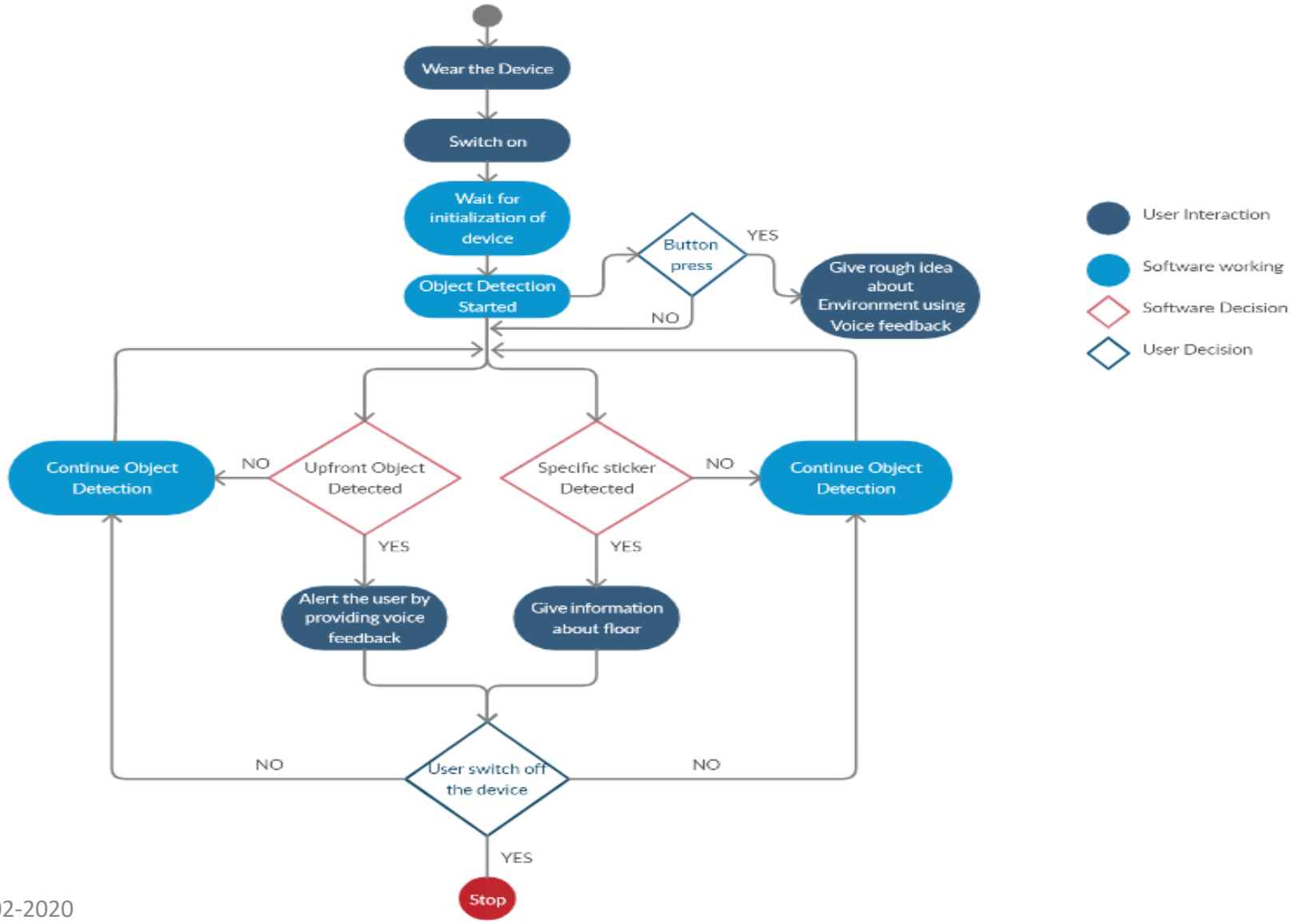
Sr No.	2
Title/Author	Yadav, A. B., Bindal, Namitha, K., & Harsha, H., "Design and development of smart assistive device for visually impaired people." in IEEE International Conference On Recent Trends.
Method used	Colour absorptivity index
Advantage	Variable Haptic Feedback
Disadvantage	No proper identification of upfront object
Extracted Methodology	Different objects were considered and the detection of their distances from the object were recorded. It is known that different colors have different absorptivity. Black is found to have the highest absorptivity and white the least. Due to this difference in absorptivity of light the range obtained for different colors vary.

PROPOSED SYSTEM



Design(Flow Of Modules)

ACTIVITY DIAGRAM



RESULTS AND DISCUSSION

- On being tested in the campus we found that the device was capable of giving near real time information to the user regarding all the obstacles in his/her path
- It could also determine the orientation (left/right) of the detected object which was a huge help for the user
- The Environment Description Module, trained on only 8000 images available in the Flickr8K dataset, worked decently and could work even better if trained on a larger dataset

CONCLUSION/SCOPE

- The device will make the use of various technologies in order to create a single device capable of assisting the huge number of people in need.

- The device will be making real time predictions without any human help, it will be an added benefit as the people using this device will be able to walk around the campus without any external human help.

POSSIBLE FUTURE ADDITIONS

- The primary language currently is English but we can also add language support for Hindi and Marathi
- Implement this solution for area other than our campus

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