IoT-Based Smart Eye for Blind People

Project Overview

Introduction

This project focuses on developing a smart eye device to assist visually impaired individuals in navigating their surroundings more effectively. The system utilizes a Raspberry Pi 4, two webcams for object detection, a headphone for audio feedback, and a GPS module for location tracking. Additionally, an emergency button is incorporated to ensure the user's safety.

Hardware Components

Raspberry Pi 4:

Central processing unit for running the object detection algorithm and managing device functionalities.

Webcams (2):

Used for real-time object detection to identify objects in the environment.

Headphone:

Provides audio feedback to the user by announcing the names of detected objects and their respective distances.

GPS Module:

Enables live tracking of the user's location, enhancing overall navigation capabilities.

Emergency Button:

Allows the user to trigger an emergency alert in case of any urgent situation.

Object Detection Algorithm

The system employs a sophisticated object detection algorithm to identify and classify objects in real-time. The algorithm processes video feeds from the webcams and provides audio feedback through the connected headphone.

GPS Integration

The GPS module continuously tracks the user's location, sending real-time updates to the accompanying mobile application. This ensures that the user's live location is known at all times.

Mobile Application

The mobile application serves as a companion to the smart eye device. It displays the user's live location on a map and incorporates an emergency button feature. In the event of an emergency, the user can press the button, triggering an alarm and sending the current location to the mobile app.

Conclusion

The IoT-based smart eye for blind people is a significant advancement in assistive technology. It empowers visually impaired individuals by providing real-time information about their surroundings and enhancing their overall safety through GPS tracking and emergency alert features.