

RESEARCH WORK-6

Title: Low-cost Smartwatch for Blind People using Arduino Uno



Project Description:

This project aims to design a low-cost smartwatch for blind people using an Arduino Uno microcontroller. The smartwatch will use sensors to detect obstacles and changes in elevation, and provide haptic feedback to the user through a vibration motor or piezo speaker. The device will be designed to be worn on the wrist, and will be compact and lightweight. The Arduino Uno microcontroller will be programmed to read sensor data and provide appropriate feedback to the user. Bluetooth connectivity will also be added to the smartwatch, allowing it to connect to a smartphone app for additional functionality such as GPS navigation or text-to-speech. This project will provide a low-cost and effective solution to help blind people navigate the world around them.

Components Required:

- Arduino Uno microcontroller board
- Ultrasonic sensor module (for obstacle detection)
- Accelerometer module (for elevation detection)
- Vibration motor or piezo speaker (for haptic feedback)
- Bluetooth module (for smartphone connectivity)
- Battery and charging module (for power supply)
- OLED or LCD screen (optional, for displaying information)
- Breadboard and jumper wires (for prototyping)
- Resistors and capacitors (for circuit protection)
- Custom 3D-printed or modified off-the-shelf enclosure (for aesthetics and protection)

Working :

- The Arduino Uno microcontroller reads data from the sensors (ultrasonic and accelerometer) and uses this information to detect obstacles and changes in elevation.
- If an obstacle is detected, the microcontroller triggers a vibration motor or piezo speaker to provide haptic feedback to the user, alerting them to the obstacle.
- If a change in elevation is detected, the microcontroller provides a different haptic feedback to the user, indicating whether they are going uphill or downhill.
- The Bluetooth module allows the smartwatch to connect to a smartphone app, providing additional functionality such as GPS navigation or text-to-speech.

- The battery and charging module powers the device, allowing it to be used for an extended period of time without needing to be recharged.
- The OLED or LCD screen (if included) displays additional information such as battery life, Bluetooth connectivity status, and other relevant data.
- The custom 3D-printed or modified off-the-shelf enclosure protects the device and adds an aesthetically pleasing design.

Goal of the Project:

The ultimate goal of designing a low-cost smartwatch for blind people using Arduino Uno is to provide an affordable and accessible device that helps visually impaired individuals navigate their environment safely and independently. This project can empower visually impaired individuals to better navigate the world around them, increasing their independence and confidence.