

## ABSTRACT

According to the World Health Organization (WHO), around 285,000,000 people suffer from impaired vision, and around 39,000,000 of whom are blind. The people with blindness have difficulties in detecting obstacles when walking down the streets. Unfortunately, some weaknesses have been found in the prototype that has been developed, including low accuracy in obstacle detection and less informative feedback. To overcome this weakness, in this final project, some improvement was made to make the prototype more accurate and more informative feedback. Navigation features was also added so that users can achieve a destination intended correctly. To improve the accuracy, in this final project applied ToF method (The Time of Flight) and for feedback response to be more informative then implemented Text-to-Speech to convert data from microcontroller into sound. This prototype utilized Google Maps API to find the nearest navigation path and the Serial protocols the communication protocol of data transmission from microcontroller to Android applications. According to the testing results, the accuracy of distance detection from objects used in this system is considered good with an average accuracy of up to 97.21 percent during the night and 97.10 percent during the day.

**Keywords :** obstacles, ultrasonic, Android, *Text-to-Speech*, bluetooth, Google Maps API.