

Abstract

People with visual impairments often experience difficulties with navigation due to obstacles and hazardous ground conditions. The lack of current devices unable to adequately meet the needs of persons with visual impairment presents the need for research to be done into the development of technologies that can be used to create more effective tools. While many assistive devices for people with visual impairment are able to detect general obstacles, very few focus on or can detect ground-level obstacles. Currently, there are no commercially available technologies that are able to easily detect ground conditions and relay that information to a user. The goal was to investigate technologies that could be used in the detection of ground conditions and ground-level obstacles. Distance readings were used from ultrasonic sensors to show that obstacles and their proximity can be detected. The amplitude of signals from ultrasonic sensors were collected and compared for different ground conditions. This technology and information could be applied to detect hazardous ground conditions in a device for persons with visual impairments.

Keywords: Ultrasonic sensors, assistive device, visually impaired, ground condition, obstacle detection, hazards