



ELECTRONIC GUIDE STICK USING ULTRASONIC SENSORS AND ARDUINO WITH EARPHONE ASSISTANCE FOR THE VISUALLY IMPAIRED PEOPLE

Mariciel Marcial-Teogangco

James Patrick P. Huelar, Romie D. Prado, Roberto S. Sto. Domingo III, Joedel A. Tamadiles

<http://orcid.org/0000-0001-9512-7116>

mariciel.teogangco@perpetualdelta.edu.ph

University of Perpetual Help System DALTA – Molino Campus, Philippines

ABSTRACT

In the Philippines, there are about two percent 2% of the country's population is suffering with moderate or severe visual impairment according to Department of Health DOH based on 2011 record. The conventional assisting device used by these visually impaired individuals is the guiding stick. Though the guiding stick provides independent mobility for walking, it has some limitation on the range of the navigation. The electronic guide stick in this paper uses the ultrasonic sensors arranged in a way that it detect pits, downfalls, and obstacles in front of the user. The electronic guide stick can provide notification to the user in the form of vibration and tone which vary depending on the range and location of the obstacle. The microcontroller Arduino Uno processes the inputs from the ultrasonic sensor and produce vibration and tone according to the distance of the obstacle. The electronic guiding stick has a maximum of 3.5 meter range of sensing and the device can last for 5 hours without charging. Improvement on the size and weight of the device should be considered and the device is too sensitive on falling objects.

Keywords: Arduino, Guide Stick, Ultrasonic Sensor, Visually Impaired