

ABSTRACT

For people with non-functional visual impairments (blindness), the assistive device commonly used is a cane. However, a regular cane is considered less effective when used in the midst of crowded activities and in conditions that may be challenging for the visually impaired. To help visually impaired individuals be aware of obstacles, a walking aid with an Internet of Things system was created. With the help of the Arduino Nano microcontroller, the HY-SRF05 ultrasonic sensor measures the distance of visually impaired individuals from obstacles in front of them, supported by sound notifications from a buzzer. There is also a water level sensor that can detect puddles through vibrations produced by the motor's vibrations. Equipped with a GPS tracker to help locate visually impaired individuals when they are lost. In the Internet of Things (IoT) system, ESP32 is used as a microcontroller for communication with Telegram. GPS as the sender of coordinate data to the ESP32 to be sent to Telegram. This tool is made using the intelligent Mamdani fuzzy logic method, which is suitable for uncertain environments. Based on the test results, this walking aid system for visually impaired individuals can function well. with, the ultrasonic sensor 1 shows a repeatability level of 99.622%, while the ultrasonic sensor 2 has a precision level of 99.855%, and the water level sensor has an accuracy level of 99.063%. Then, the fuzzy system designed for this device has an accuracy of 99.77%.

Keywords: *Assistive device for the visually impaired, IoT, Fuzzy logic, Ultrasonic HY-SRF05, Water level*