

ABSTRACT

Traditional white canes utilized by visually impaired people have notable drawbacks, especially in identifying obstacles that are above ground level. This study outlines the creation and evolution of a Smart Cane System utilizing the Internet of Things (IoT) to improve the Mobility and Safety for visually impaired users. The system combines Ultrasonic Sensors, Infrared Sensors, a GPS Module, and the YOLOv4-Tiny Deep learning algorithm running on a Raspberry Pi 4. The cane is capable of sensing obstacles from various angles, offering feedback through vibrations and sounds, and enabling Live location tracking for the user's family. Testing indicates that Obstacle detection accuracy reaches 92%, and the GPS system successfully relays the user's location. This Smart Cane aims to enhance the independence and Confidence of visually impaired individuals in their everyday activities through the integration of AI, IoT, and ergonomic design. Smart Cane technology for the visually impaired leverages the Internet of Things incorporating Deep learning models, utilizing Raspberry Pi and YOLOv4-Tiny for enhanced Navigation.

Keywords: Smart Cane, visually impaired, Internet of Things, Deep learning, Raspberry Pi, YOLOv4-Tiny