WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

CareNav Walking Stick

[1st]B Ramesh, [2nd]Monica S, [3rd]Banupriya B, [4th]Chandana S, [5th]Bhagya Jyothi

[1]Asst. professor, Dept. of CSE City Engineering College, Bengaluru-560062, Karnataka, rameshb@cityengineeringcollege.ac.in
[2]UG Student, Dept. of CSE, City Engineering College, Bengaluru-560062, Karnataka monicas8891@gmail.com
[3]UG Student, Dept, of CSE, City Engineering College, Bengaluru-560062, Karnataka pbanupriya427@gmail.com
[4]UG Student, Dept, of CSE, City Engineering College, Bengluru-560062, Karnataka ammuchandhu32@gmail.com
[5]UG Student, Dept, of CSE, City Engineering College, Bengluru-560062, Karnataka jyo636361@gmail.com

Abstract-

The CareNav walking stick is an intelligent assistive. mobility tool ensure the safety, presumption, and autonomy of sight. impaired users. Traditional walking sticks have no other recourse but to bodily touch, and to give. reduced protection and latency of hazard. detection. CareNav overcomes disadvantages through combining several smart technologies into one miniature device. The system relies on ultrasonic sensors in a proactive way. A GPS module of obstacle detection real-time location tracking, and a GSM SMS sending emergency unit with live coordinates of caregivers when needed. Moreover, an RTC unit is supported. reminders of medication, assisting users have regular health practices without assistance. The entire elements are managed by a Arduino microcontroller and powered by a long operating rechargeable battery duration. The integration of several supportive functions into a single low-priced device, the CareNav walking stick provides all-encompassing solution that would go a long way improves flexibility, security, and health a magazine that serves the visually impaired population.

I. INTRODUCTION

CareNav walking stick was conceptualized to overcome the drawbacks of the traditional mobility aids to visually impaired individuals. Walking sticks identify ordinary objects. only in the physical contact the obstacles can be overcome expose users to danger in their day to day navigation. CareNav incorporates the contemporary sensing and communication technologies in order to provide early. warnings, real-time help and better situational awareness. Day-to-day activities including defining challenges far away, it is choosing the right way surroundings,and requesting help in crises bring out the necessity of a sophisticated system. CareNav answers these requirements by means of ultrasonic-based obstacle detection,GPS-location tracking, and a fast emergency alert a mechanism. The ultrasonic sensor constantly search the user direction and provides feedback is provided immediately as vibrations or whenever there is a hindrance it cues the sound identified, assists the user to travel with greater safety and confidently.Beside the support of navigations, CareNav.offers real-time GPS positioning which enables family monitor the user of the system by members or caregivers real time, a much-welcome occasion feature in congested or unknown outside environments. The built-in SOS button sends accurate coordinates and instant alerts, which guarantees that aid can be availed to the user in a short time critical situations. To support daily health routines, a medication is also included in the device reminder functional operated by an RTC module, lessening reliance on others.CareNav will have the combined capabilities is not evidenced only as a mobility tool but also as a personal security and support system.

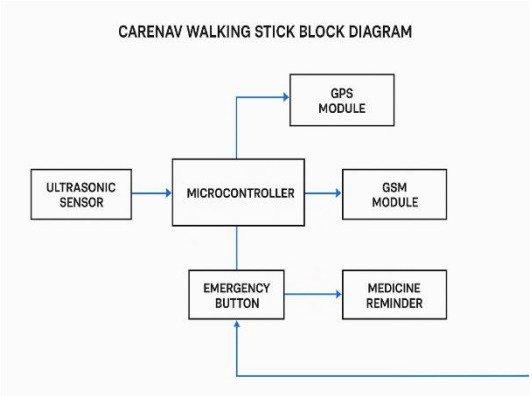

Fig 1: Block Diagram of CareNav Walking Stick

II. LITERATURE SURVEY

John Bush Idoko, Ramiz Musallam Salama and Dilber Uzun came up with a smart walk stick to help the visually impaired people who experience considerable difficulties in the inability to move around daily because of sightlessness. Many users depend on support by others or professional guide dogs in the field navigation. The scholars suggested a more improved strolling stick installed with an ultrasonic sensor, buzzer, and vibration motor. When an obstacle is detected, both auditory and are activated by the device tactile notifications, so that the user can respond promptly. This whole system became operational written in the C program language. Suleiman Abdulhakeen, Suleiman Zubair and A Personal Area was designed by Chika Innocent. Smart guide to support Network Smart guide to support is a smart guide built on networks (PAN).blind users in the navigation of the indoor and outdoor. environments. Among the great challenges is one accompanied by imageless sight persons recognizing the road conditions and evading impacts with objects that are in motion or at rest. They have an ultrasonic sensor in their system hurdles and then gives the user sound alerts and vibration cues. The device also provides directional help by pointing the user to obstruct right or left when there is an obstruction direct in face, a simple and effective one and economical traveling guide.

III. METHODOLOGY

The smart walking stick was developed follows a workflow in a structured manner that incorporates hardware and software to be tackled mobility, safety, and healthcare needs of visually impaired users. The process begins with identifying system requirements by means of user analysis and literature review. In this research, such features include obstacle identification, positioning, emergency and medicine-reminder functions are known to be the main goals of the design. Then, the appropriate components are chosen to implement these functions. Ultrasonic sensors Obstacles around are detected using (HC-SR04). since they were constantly measuring distance ability to work in diverse settings. A GPS receiver (NEO-6M) provides real-time coordinates, and a GSM chip (SIM800L) enables the emergency SMS notifications in case of the SOS button is activated. Medicine-reminder. An RTC module is used to handle functionality. The correct timing of (DS3231) which guarantees correct timing scheduled alerts. An Arduino Uno or Nano is the controller in chief, which co-ordinates all of the modules, with a rechargeable Li-ion battery as power in the system supply. A circuit diagram is drawn to indicate in detail how every sensor and module and output device is attached to the microcontroller. Custom Obstacle is dealt with by Arduino programming detection, alarm creation, access to GPS, GSM message transmission, RTC alarms. The individual components are then tested separately, and thereafter followed system testing to test that fluent teamwork and sound performance. across the entire device.

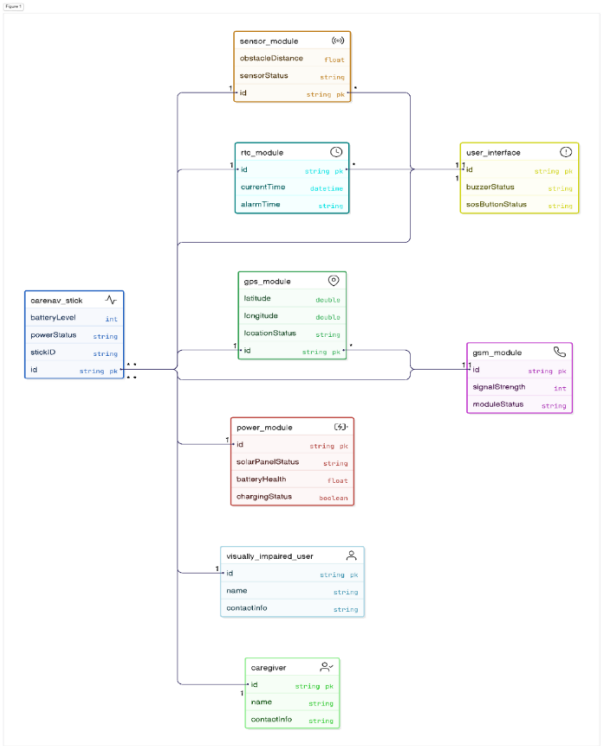

Fig 2 : Class diagram of carenav walking stick

IV. RESULTS AND DISCUSSIONS

The suggested CareNav walking stick offers a powerful, reliable and convenient system assistance solution with the aim of enhancing the of visually, mobility, safety, and independence impaired users. By combining ultrasonic barrier identification, real-time GPS positioning, Emergency communication

based on GSM, and a the system rechargeable power module promotes classical walking aids into a modern smart device. It continuously scans the way a user will go, identifies obstacles around and provides real-time tactile or sound notifications, thus reducing the risks of accidents during everyday movement. The central controller is an Arduino Nano, and the sensor inputs are efficiently handled, and the ultrasonic sensor gives a proper distance in its range of detectability. The GPS and GSM modules integrate to work together forward accurate place information in the course of emergencies, which enables the caregivers to act quickly. The DS1302 RTC module is added, as well and LCD screen add more functionality to it providing time keeping and medication.

reminders, assists users in keeping track of something important daily routines without assistance..

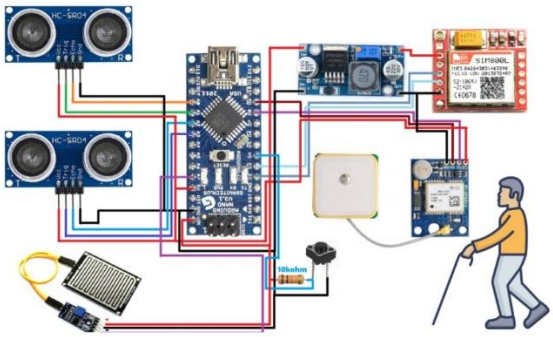

Fig 3: Setup of device

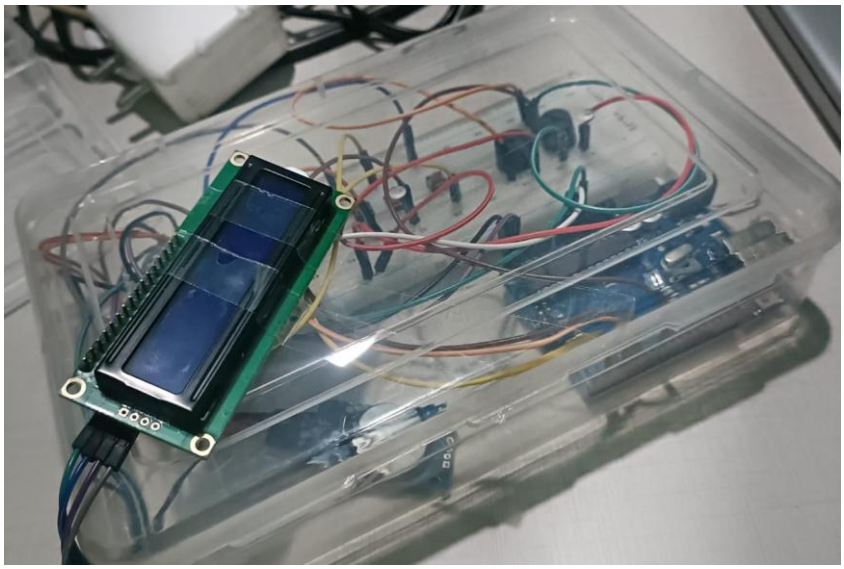

Fig 4: medicine reminder

Fig 5: When SOS button pressed

V. CONCLUSION

CareNav walking stick (Multi-purpose) can be a useful assistive solution to through integration, the visually impaired integrate several intelligent technologies into one device. Obstacle is also one of the features location tracking, detection, and GPS-based location tracking the system does not only provide medication reminders enhances both movement and security and also promotes the user's overall well-being. This innovative tool increases autonomy with providing caregivers more confidence about the daily routine of a user and health practices.

VI. ACKNOWLEDGMENTS

We would like to say a hearty thanks to Prof. B.Ramesh With your precious advice and technical assistance during this project. We also recognize the Department of Computer. The provision of science and Engineering hardware and laboratory resources essential to our work. Our gratitude further visits City Engineering college and NSGM to provide helpful references, and to the lab employees to help with calibration of sensors and hardware integration.

City Engineering November 2025. College, Bengaluru

REFERENCES:

[1] Shinohara K (2006) Designing assistive technology for blind users. In: Proceedings of ACM Sig ACCESS 8th international. Computer accessibility conference, pp. 293 294.

[2] Benjamin JM, Ali Schepis NA (2010) A laser cane for the blind. In: Proceedings of the San Diego biomedical symposium, vol 12, pp.53-57 3.

[3] Shah MA, Musavi SHA, Malik SA (2010) Navigation through a DGPS-based hand-held (blind) unit. Aust J Basic Appl Sci 1450-1451.

[4] Borenstein J, Ulrich I (1997) The guidecane a computerized travel assistance of the active leadership of blind passers-by. In: Proceedings

of the International conference of IEEE on robotics and automation, pp. 1283-88, 1997. 5.

[5] Mahmud MH, Saha R, Islam S (2013) Smart walking stick- an electronic solution to support the vision impaired individuals. Int J Sci Eng Res 4:111-114 6.