Chapter 44
Internet of Things (IOT) Solution for Increasing the Quality of Life of Physically Challenged People

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ABSTRACT

Visually Impaired (VI) people generally face difficulties during their pedestrian commute, when forced on to side-walks cluttered with vendors, animals and other obstacles. No single system can comprehensively cover all of their mobility needs. The proposed system intends to provide smart electronic aid for the VI which is appropriate to complement their white cane using the principles of the IoT. It detects any low-lying obstacles on its course and alerts the user to them and also uses Global Positioning System (GPS) technology which is a component of any smart phone, to pinpoint the VI's location when necessary. A feedback system, which is essentially a simple auditory circuit, which alarms the user of any obstacle, and informs priory designated guardians about the VI's current whereabouts, done by transmitting the coordinates of VI to a registered mobile number fed into an Android Application.

INTRODUCTION

IoT is an emerging technology in the computing and communications sector which enables a network of smart devices to interact seamlessly. Generally speaking, IoT refers to the networked interconnection of everyday objects, which are often equipped with all-pervasive intelligence, meaning it will increase the reach of the Internet by integrating every object for interaction, which leads to a highly-distributed network of devices communicating with human beings as well as other devices (D Wang, 2014). Objects that are used every day get transformed into smart objects able to sense, interpret and react to circumstance owing to the combination of the Internet and emerging technologies. This technology brings about a change in the way communication happens between people, things and environment. According to this paradigm, many of the objects that surround us will be on the network in one or the other form. Sensor network and Frequency Identification (RFID) and technologies will emerge to meet this new challenge, in which information and communication systems are invisibly embedded in the environment around us. This novel computing paradigm will need to go beyond traditional mobile computing scenarios that use smart phones and portable devices, and evolve into connecting everyday existing objects and embedding intelligence into our environment.

The IoT has many applications and makes familiar devices responsive to smartphones via the Internet. It has the potential to impact socially, economically and also environmentally. Appropriate decision and action can be taken with the help of precise information about the status, location and identity of things, which forms a part of the environment. IoT concepts have been manifested in a wide range of domains, from logistics, transport and asset tracking, smart environments (homes, buildings, infrastructure), to energy, defense and agriculture. In essence, IoT impacts and certainly has the potential to significantly influence all facets of society (Coetzee, 2011). Its applications also include physical presence in lighting and heating products, safety and security monitoring devices, health products, intelligent traffic management and waste management systems. It is apparent that IoT is relevant in every step in every value chain (D Wang, 2014).

A standout amongst the most pervasive effects of IoT is its ability to reach out to the community, which is extremely vital. It has a great potential to be effective if sufficient consideration is taken during execution. It is a solid conviction that the IoT can offer individuals with disabilities the necessary help that they need for them to attain a better quality of life, thus encouraging them to take part in social and economic activities. While the IoT still being in its developing stage is only starting to have an impact on the lives of people with disabilities, the possibilities for the future seem endless.

VI faces many challenges while travelling. They typically use canes, but the traditional cane cannot detect objects higher than the waist. The lack of support services makes them rely completely on another person for guidance, which prevents them from being economically active and socially included. No single existing system can satisfy all of their needs. The project intends to successfully utilize IoT infrastructure. Based on the VI user's perception of his state of awareness, relevant information is retrieved using IoT infrastructure for positioning. The proposed project is cost effective and has easy to use obstacle detection unit that is appropriate to complement a walking stick for the VI. In addition to this, the project attempts to make an application interface to assist the VI through auditory feedback and also to help their family track their movements. Individuals with complete visual blindness or low vision frequently have a herculean task of self-exploring the outside surroundings. Strolling down a crowded road with just the white cane may cause a lot of problems for the VI. The lack of support services can make them completely dependent on their family members, which prevents them from being financially

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