A Nurse Bot for Elderly People

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A Nurse Bot for Elderly People

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Abstract
In this study, an automated healthcare assistance "Nurse Bot" has been developed for elderly population. For past few decades, life expectancy has increased and the global percentage of elderly population is upward. But the rise of this ageing population gravitates towards different health related problems. Therefore, they need extra care and some sorts of assistance to make their life comfortable. Elderly people tend to forget to take their medicines on time. In this research, we have developed an automated mini robot with a scheduler and a monitoring system, which delivers medicines to the elderly person on scheduled time. We have constructed a cost-effective system, so that majority of the people can afford it. Besides that, to evaluate the efficacy and efficiency of this system, we visited a retirement home. During our demonstration, we received enthusiastic and positive responses from the authority and the residents of that retirement home.

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Author Keywords
Healthcare; Elderly Support; Low Cost Robotics; Developing Country; ICTD.

Introduction
I am Dibya Prokash Sarkar, currently studying BSc in Computer Science and Engineering under the Department of Electrical and Computer Engineering in North South University, Bangladesh. I have enrolled myself in this program in Fall 2014 session. I am currently in my final year and expecting to complete my under graduation in Fall 2018. My research interests are in Human Computer Interaction (HCI), Bioinformatics and Robotics.

Research Works
In recent years, I have done few research works. One of the major works is where I have worked on developing a low-cost automated mini nurse-bot, which is able to assist the elderly people to take medicines according to their schedule. This nurse bot is initially built only for research purpose, but now we are planning to develop it further and add more features according to the need of elderly people. The user case study of this project has been accepted for UBICOMP 2018 poster.

Purpose
To me research work is always fascinating, because you can develop something new, something unique that intrigues me a lot. I am currently associated with some research works. But in recent times, I am working on

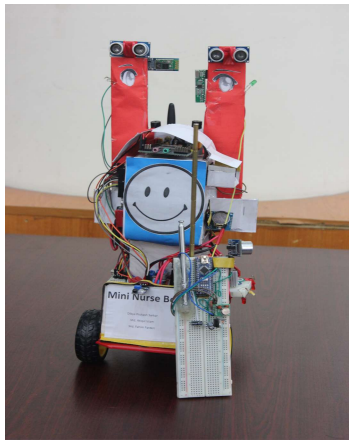

Fig 1 Prototype of Nurse-bot

Human Computer Interaction (HCI). Although it is a new concept to me, but I find it very interesting, because it is all about for the benefit of the human being. It is a design and creative based research field where you have to develop something which should be human friendly. As UBICOMP 2018 is offering a daylong workshop session for the prospective students and researchers who are working in the field of ubiquitous and wearable computing. To me, it is a great opportunity not only to enhance my knowledge and skill, but also to establish a connection with the researchers who are working in this field. Besides that, it will be very helpful for me and for my academic career to have a vast knowledge on ubiquitous computing, which will immensely help me for my future research works.

Project Description

Gradually number of elderly population is increasing and thus the health-related concerns are becoming vibrant, because they are prone to have different chronic diseases as well as mental and physical ailments. Elderly people like to lead an independent life, but they have a propensity to forget to take medicines. Therefore, an external intervention is required to make their life convenient. Nowadays robots are taking lots of challenging tasks. However, most of these robots are expensive and built in the context of developed countries, not considering the economic capabilities of vast population. But we developed our robot at low-cost and built with the resources available in market.

Figure 1 is the prototype of our robot. The main purpose of this robot is to serve medicines to elderly people on time. Initially multiple medicine delivery schedule has to be set by the user. Robot starts operating its functions at the scheduled time and it tries to detect the destination, which is the source of transmitted signal. While robot tries to detect the destination, at the same time it keeps buzzing. After reaching its destination, it opens the medicine box where the medicines are kept. Buzzer will keep buzzing and medicine box will remain open until the patient has taken the medicine. After taking the medicine patient will press a switch that will close the medicine box. When the switch is pressed robot will send a confirmation message to the user. But if patient does not press the switch then robot will keep buzzing and after 15 minutes system will send a reminder message to the user, which will help the user to notify the situation of the patient by using other mode of communication system.

After development, we have demonstrated our robot in an old home. Then we have conducted a user study, where we tried to note down the opinions of the residents of that old home. Besides that, we also tried to know what sort of features they want more from our robot. We have received positive responses about our robot from the authority and the residents of that old home.

Conclusion and Future Work

This is an automated robot, which helps to deliver medicine to elderly people on time. Now we are planning to develop it further. For further development, we are thinking to introduce data logging system, which will keep data of medicine deliveries. Moreover, features like Wi-Fi module, which will help to keep in touch with the user if any help required. Adding Bluetooth with Fitbit to sense the blood pressure of the patient and if it can sense any trouble then it will notify the situation to the user. It is a very low budget robot and I hope that this robot can add new dimension in the field of robotics.