IBM TEAM 23

Personal Assistant for Senior People Who are Self Reliant

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Literature Survey

1.HABITAT: An IoT Solution for Independent Elderly (Andrea Galassi, Marina Barbiroli)

Publication: ARCES- Advanced Research Center On Electronic Systems "Ercole De Castro", University of Bologna,Italy

Year: 2019

In this work, a flexible and extensive digital platform for Smart Homes is presented, exploiting the most advanced technologies of the Internet of Things, such as Radio Frequency Identification, wearable electronics, Wireless Sensor Networks, and Artificial Intelligence. Thus, the main novelty of the paper is the system-level description of the platform flexibility allowing the interoperability of different smart devices. This research was developed within the framework of the operative project HABITAT (Home Assistance Based on the Internet of Things for the Autonomy of Everybody), aiming at developing smart devices to support elderly people both in their own houses and in retirement homes, and embedding them in everyday life objects, thus reducing the expenses for healthcare due to the lower need for personal assistance, and providing a better life quality to the elderly users. Measures of health promotion and primary prevention are necessary to maintain and increase competencies in later life. Focusing on personal-behavioral factors, many studies in literature demonstrate that physical activity is a prerequisite for successful aging as well as emotional and motivational involvement in daily activities. Moreover, social functioning and social participation also have an influence on healthy and active senescence.Aging is associated with life changes that require adaptation and adjustment and elderly people sometimes have to cope with multiple critical life events. One of the most challenging and sometime inevitable changes in aging is the loss of autonomy in the daily living activities implying a modification of the living environment, in order to make it suitable for growing needs.

2. Internet-of-Things and Smart Homes for Elderly ,Healthcare: An End User Perspective (Debajyoti Pal, Suree Funilkul)

Internet-of-Things-based smart home solutions can provide an improved and better approach to healthcare management, yet its end user adoption is very low. With elderly people as the main target, these conservative users pose a serious challenge to the successful implementation of smart home healthcare services. The objective of this research was to develop and test a theoretical framework empirically for determining the core factors that can affect the influence of the elderly peoples' acceptance behavior. This paper provides the groundwork to explore the process of the actual adoption of smart home services for healthcare by the elderly people with potential future research areas.elderly users' acceptance of smart home services for healthcare. Accordingly, an online survey was conducted with 254 elderly people aged 55 years and above across four Asian countries. Partial least square structural equation modeling was applied to analyze the effect of eight hypothesized predicting constructs. The user perceptions were measured on a conceptual level rather than the actual usage intention toward a specific service. Performance expectancy, effort expectancy, expert advice, and perceived trust have a positive impact on the behavioral intention. The same association is negative for technology anxiety and perceived cost. Facilitating conditions and social influence do not have any effect on the behavioral intention. The model could explain 81.4% of the total variance in the dependent variable i.e., behavioral intention. Effort expectancy is the leading predictor of smart homes for healthcare.

3. Fog IoT for Health: A New Architecture for Patients and Elderly monitoring (Abdessamad Assila)

Publication: University of mons, Belgium.

Year: 2019

The important increase of the elderly population and their desire to conduct an independent life, even when having medical diseases related to their age, requires the development of new technologies to ensure optimal living comfort for this population. In addition, another category of people, those who are patients with life-threatening problems, may benefit from preventive medical monitoring. In this paper, we present a Fog IoT Cloud-Based Health Monitoring System by using physiological and environmental signals allowing us to provide contextual information in terms of Daily Living Activities. Our system enables healthcare providers to follow up health state and behavioral changes of elderly or alone people. Moreover, our system provides a monitoring rehabilitation and recovery processes of patients. Our Fog-IoT architecture consists of a wireless sensor network, a local gateway for data stored locally and quickly, and a Lambda cloud architecture for data processing and storage. The originality of our work resides in the graphical monitoring of new and recent patient data at local smart gateway level. This checkup gives the opportunity to the medical staff quick access to the data, and allows them to validate the observed anomalies. Finally, if a telematic break occurs, the gateway continues to accumulate the data while conducting their analysis. Anonymized data are sent periodically from Smart Gateways to the cloud for archiving and for checkup by medical staff who follow up with patients

4. Implementation of smart monitoring system with fall dectector for elderly using IoT technology (Norharyati Harum)

Publication: Technical University of Malaysia Malacca

Year: 2018

Vehicular ad hoc network (VANET) is a network that is formed when vehicles with wireless transceivers have the need to communicate with each other. Although VANET shares some similarities with mobile ad hoc network (MANET), the dynamic nature of VANET has posed a challenge in designing routing protocols. This paper shows the performance evaluation between unicast and multicast routing protocols implemented in a vehicular environment that is based on the Manhattan grid model for transmission between one sender and multiple receivers. Unlike multicast transmission in geocast routing, the multiple receivers for the paper scenario are not located in a specific geographic region. Performance is evaluated in terms of average end-to-end delay, throughput, packet delivery ratio and routing overhead. The results reveal a consistent performance for multicast protocols as the number of receiving nodes increases during the transmission. . VANET is related to Mobile Ad hoc Network (MANET) in terms of its basic principle, but it does not rely on fixed infrastructure for communication and data dissemination; however permanent network nodes in the form of roadside units can be useful in some circumstances. VANET also shares a few common MANET characteristics such as self organization and self-management, short radio transmission range and limited bandwidth

5.Personal Assistance Device for Independent Senior Citizens/Patients(A.Yuvaraj, B.N.Gunasekhar Reddy)

Tracking the health of a person and proper medication improves their lifetime. Studies suggest that most of the deaths of the elderly people have occurred during the night when the person is asleep. A Caretaker cannot assist a person all the time. This work proposes a personal assistant for an elderly person or a patient. The Personal assistants can provide in-home respite care, allowing family members or other caretakers to take a temporary break. The main objective of this work is to help seniors maintain their quality of life at home and to keep them living their lives their way, as well as to lighten the load of full-time or family caretakers. This paper proposes an affordable personal assistance device for health monitoring of elderly people using different sensors which can measure pulse rate, position of elderly. Therefore the doctor can identify the abnormal values easily and can attend to the patient if the device is used in the hospital. Proper intake of medicine at the correct time is indicated by the display on the OLED screen and an alert is produced by buzzer.