WiP Abstract: RemCare- Remote Caregiver using Integrated Framework for People with Cognitive Disability

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Abstract—**In recent years, people with cognitive disability has increased rapidly. The increase of them considerably affects the family and society that interact with the cognitively disabled person. Children with developmental disability or patients with dementia need to monitor and track their behaviors for their safety. We design smart tracking system which effectively can help to trace their location and to monitor their activities. The system applies a wireless sensor network with an efficient sensor deployment method and an adaptive packet scheduling algorithm. In addition, it provides the real-time monitoring to observe their situation and gives a quick alerting to them and caregivers. In this paper, we present an overview of an integrated framework.**

Keywords-localization; sensor network; monitoring system; cognitive disability

I. INTRODUCTION

Cognitive disability generally refers to any disability affecting mental processes such as mental retardation, attention-deficit hyperactivity disorder (ADHD), and learning disabilities. People with cognitive disability is increasing rapidly, and has increased more than 50 percent for three years. The cognitively disabled persons require active support and interest of society. However, it has significant constraints in terms of cost, time, and space since most of the care should be performed between a disabled person and a caregiver. In addition, it is practically difficult to take care of them constantly and to monitor them at all times. Hence, the lack of caregivers is a major issue. In order to care for them effectively, there is a need for a system that can track their position and monitor their behaviors continuously.

There are many theories to help people with developmental disabilities and with dementia, including monitoring technologies to observe their daily life [1]. However, in previous studies, there is few a unified framework that integrates several systems into one. We propose an integrated framework of tracking and monitoring system which effectively can follow their location and monitor their activities. First, a device fusing various sensors is attached on the user wrist for detecting the dangerous objects, and multiple sensors are placed on the ceiling for tracing the user. Then, we determine a dangerous situation by analyzing the current conditions through activity analysis based on machine learning. If the analysis result is determined to be the dangerous situation, the system informs the emergency situation to the caregiver at the remote location and alerts to the user.

II. OVERVIEW OF FRAMEWORK

The system is composed of two major technologies: tracking and monitoring, as shown in Fig. 1. In order to effectively estimate the position of the user, we apply a wireless sensor network that is generated by an efficient sensor deployment method and an adaptive packet scheduling algorithm. To monitor and alert the dangerous situations in real time, we focus on rapidly transferring information and extracting accurate data.
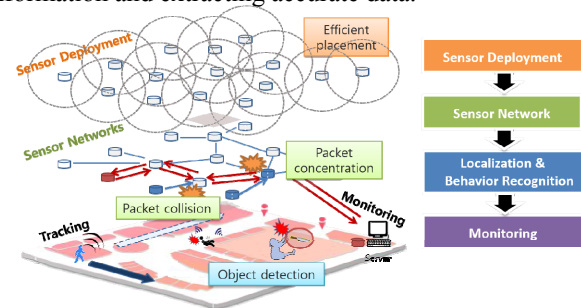

Figure 1. An outline of smart tracking and monitoring system

III. CONCLUSION AND FUTURE WORK

We present the framework of smart tracking system that supports stable and safe environments to the cognitively disabled persons and the caregivers. There are many challenges constructing this system, such as managing a number of data and transferring a variety of data. In future work, we will implement this system to overcome these issues and then it should be tested in a real-world environment.

REFERENCES

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