

A Metaverse Client of an Assisted Living Support Service System for Extended Family

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Abstract - *In the Internet of Things (IoT), devices gather and share information directly with each other and the cloud, making it possible to collect record and analyze new data streams faster and more accurately. These Advancements in embedded information and communication technologies present enormous potential for the intensified healthcare support of senior citizens at home. By employing these technologies in the home, senior citizens are able to live independently for a longer period of time, helping to reduce costs and the need for additional caregiver resources in the process. These techniques are applied to healthcare or safety home area on a commercial scale. But, there are many potential problems that the analysis of home situation with sensed data is not covered with the various difference homes living pattern of each person. And that's why it's extremely important to determine precisely what it has happen.*

To solve this problem, we will address the assisted living support service system (defined as a MACH: Metaverse based Assisted living support system for the Connected Home) based on a metaverse client dedicated to the smart home. MACH system supports the different living pattern of different home. And, it is able to access to the monitoring information with metaverse client. It can be support the extended family members convenient to use with a client interface.

Keywords: Assisted Living Service, Metaverse Client, Healthcare System, Remote Monitoring, Living Pattern Analysis, Context Awareness

1 Introduction

The Internet of Things (IoT) is the logical further development of today's internet. Technological advancements lead to smart objects being capable of identifying, locating, sensing and connecting and thus leading to new forms of communication between people and things and things themselves. Advancements in the Internet of Things (IOT) present enormous potential for the intensified smart home. Smart home concept may provide a variety of services dealing with multimedia (streaming video and sound, reading emails), comfort (ambient lighting, heating) as well as health supervision (blood pressure monitoring, heart attack prevention). One of the smart home services is assisted living

service that it is a residential alternative to nursing home care, support services and health care, as needed. Assisted living service is designed for individuals who require assistance with everyday activities such as meals, medication management or assistance.

Although their objectives are some different, these approaches are very similar technically speaking: the house continuously monitors the environment in order to provide better-adapted services to the inhabitant. Assisted living service has become more important owing to the increasing number of a solitary elderly or a single household. Assisted living service can support the analysis of home situation with sensed data is not covered with the various difference homes living pattern of each person. And the system has to determine precisely what it has happen to person.

Some of the existing context aware medical applications are: In VOCERA COMMUNICATION SYSTEM [1] experimentation was done in St. Vincent Hospital, Birmingham, USA. STROKE ANGEL [2] experiment was conducted at Bad Neustadt, Germany. (November 2005-May 2008). One more study was conducted for a period of 8 months in a mid-size public hospitals in the city of Ensenada, Mexico [3]. A decision-level data fusion technique for monitoring and reporting critical health conditions of hypertensive patients [4].

In this paper, we propose an assisted living support service system (defined as a MACH:Metaverse based Assisted living support system for the Connected Home) . MACH system supports the different living pattern of different home. And it supports a convenient to use access interface based on metaverse client. Metaverse client is able to compose of extended home from many nuclear home and it can be accessed by extended family members.

2 MACH SERVICE SYSTEM

In this section, we suggest a MACH service system that supports an assisted living service using the metaverse client for extended family. Figure 1 shows architecture of a suggested MACH system, which is aware of changes user's living pattern situation in smart home environments. As shown in Figure1, a suggested system is composed of several components interacting towards the others.

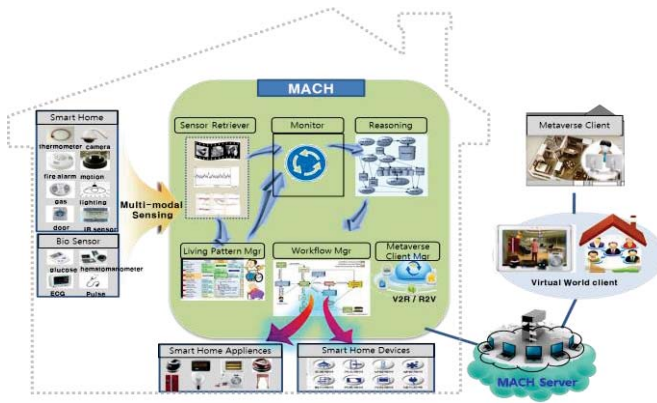


Figure I. The components of proposed system for an assisted living support service system

- **Sensor Retriever:** requests and receives sensed information from sensors of smart home. There are many kind of sensors in reality can be listed as light, temperature, humidity, camera, location, person, etc.
- **Monitor:** monitoring the user's status referencing the sensed status information and user's living pattern information.
- **Reasoning:** queries and concluded the appropriate actions to the current context.
- **Living Pattern Manager:** updates and keep up the user's living pattern with the latest information for monitor.
- **Workflow Manager:** keep up the workflow information for appropriate control on current context with the various difference homes living pattern of each person.
- **Metaverse Client Manager:** controls the virtual home environments such as extended family member, home appliances and configuration information, etc.

Those components have relationships to the others. Monitor and reasoning part receives data from sensor retriever as well as creates the event and sends to workflow manager. The workflow manager controls the home appliances or sends the status information to specified extended family members to check the user's status referencing the pre-defined workflow by users.



Figure II. The interface components of MACH client

The suggested system uses the metaverse client to control the home appliances and check the user's living pattern and status by home owner as well as the other extended family members. Figure 2 shows the interface components of MACH client. MACH client can be specified with the virtually extended family home environment, which is actually composed of many of nuclear family home units. Users establish the virtual home environment and control the virtual home status using the various client interfaces (R2V: Real to Virtual, V2R: Virtual to Real, V2V: Virtual to Virtual) for personal privacy and simplicity of the client interface.

3 Conclusions

In this paper, we propose an assisted living service system MACH to support user's healthcare by adopting personal living pattern and metaverse client. Through this system, it can be provides the assisted living care as well as the access interface for extended family members to protect privacy each other with the virtual client interface.

In the further works, we aim to test our system using the various test scenarios to get the vision up and verify our system. We will define the various test scenarios and construct the experiment environment. Through an experiment with the selected test scenario, we will show that the system can be served the assisted living support service or home security service to provide the easy to access interface the senior citizen and others. And we will running our next steps in order to more accurately detect specific resident situations through the research in the area of behavior patterns.

4 References

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