Foreword and Editorial

International Journal of Smart Home

We are very happy to publish this issue of an International Journal of Smart Home by Science and Engineering Research Support soCiety.

This issue contains 25 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

In the paper "A Study on the Performance Evaluation of User Awareness Technology based Smart Lighting Control System for Energy Saving", proposed a basic model of Smart Lighting Control System and its effectiveness is proven through the performance evaluation. The performance evaluation was carried out in the way of comparing power consumption between On/Off lighting control method and Smart Lighting Control System according to the user illumination requirement.

Paper "A Study on the Android-to-Bada Smart Game Content Converter" presented the Android-to-Bada automatic smart game converter offers a means to solve the problems of different smart platforms. It can ensure quick and automatic conversion of existing Android game content into game content for the Bada platform, thus increasing the reusability of existing content and providing smart phone users with more diverse content. In addition, the time and expense required throughout the development and conversion processes can be significantly reduced. Consequently, productivity can be enhanced, and the time and expense thus saved can be invested in developing new game content.

The paper "Automatic Deep Web Query Results User Satisfaction Evaluation with Click-through Data Analysis" proposes a click-through-data-based and unsupervised user satisfaction evaluation system, CNEITE, to evaluate the user satisfaction of Deep Web query result pages. It applies query type classifying, navigational query evaluating, informational/transactional query evaluating to solve the challenging tasks.

The Author of "Study of Wearable Smart Band for a User Motion Recognition System" described the development of an application that integrates smart TVs and smartphones with wearable devices. In addition, the paper proposed the implementation of a gyro sensor to be used in wearable devices in order to recognize user motion. The user can then save their motion information using a smart TV or smartphone for further analysis. Five movements could be measured, depending on user selection. The gyro-sensor built into the smart band calculated the repetitions of an exercise. Results of the experiment show that there was a small error rate, but the recorded movements of the user were broadly correct. Research to reduce the error rate must be carried out. The smart band is equipped with a built-in Wi-Fi module such that data communication is possible and the exercise history of the user may be stored for further analysis. The user is able to wear the smart band and practice in any location as well as see a record of the movement on a smart TV or smartphone.

The paper “Decision Support System based Site Quality Evaluation for Plantation” presents the design and development of a Web-based decision support system for site quality evaluation of plantation (SSQEP). SSQEP is an operational automatic evaluation tool that helps farmers in estimating site quality and predicting the growth performance of trees. The SSQEP consists of three subsystems: (i) site quality evaluation for forest land subsystem; (ii) site quality evaluation for non-forest land subsystem; and (iii) stand growth and yield prediction subsystem.

The Authors of “Basic Architecture and Principle Analysis of Farmland’s Automatic Irrigative System” proposes a basic architecture of farmland’s irrigative system based on the rapid development of Internet technology which can be applied to the modern management of farmland in this paper, and it introduces the component unit in detail, and analyze deeply in principle. System uploads data of farmland’s environment temperature and humidity to Internet by remote wireless. Through computer terminals’ data analysis and field controlling irrigation valve by remote wireless, it implements the intelligent of the farmland’s management.

The paper “Constructing Energy Aware Home Automation within the IPv6-USN Architecture” works to construct energy aware home automation within IPv6-USN architecture. The proposed system enables home users to check status of the home automation devices based-on IEEE 802.15.4 low-power wireless network standard and control them remotely using Home Wi-Fi and Internet.

Paper “Strategy for the Environmental Service Quality Assessment and Improvement of the Parks Based on Fuzzy-IPA- A Case Study of the Park in Xinxiang Economic Development Zone” investigated the park in Xinxiang Economic Development Zone, Henan Province. A total of 18 environmental service quality indicators of the park are included for the assessment of the public's perception of the importance and performance of environmental service quality of the park by IPA method.

In the paper “Ethernet Controller Module Design based on ARM Technology” designs an Ethernet controller module based on ARM technology, through the actual verification, its operation is stable and can be very convenient to realize embedded system networking; at the same time the system communication and debugging fast, reliable, has the very high real-time performance.

In the paper “A Resilient Device Monitoring System in Collaboration Environments” proposed a resilient device monitoring system in which agents on remote devices can collaborate with each other. The system consists of collaboration groups, proxy servers and a device monitoring server. A collaboration group consists of P2P agents and a P2P host which represents the collaboration group. The system is resilient in the sense that it finds an alternative P2P host or proxy server to continue its works in the event of a failure of the original ones. Communication protocols including communication messages and flow sequences for finding alternatives are proposed in detail, and some implementation results are explained.

The Authors of “An ImprovedFederal Kalman Filter Based on Smoother for Wireless Localization” estimate thetarget location in non line of sight (NLOS) propagation. Anapproach based on federal Kalman filteris proposed, which is called smooth-federal

Kalman filter. Federal Kalman filter uses standard Kalman filter in local filter to processes data in a forward recursion. Kalman smoother which processes data in a backward recursion is addressed in ordinaryfederal Kalman filter. Simulation and comparison results showthat the estimation of the proposed approach performs superior to federal Kalman filterin NLOS propagation.

Paper "Bayesian Model of Multisensory Comfort and Adaptation in Intelligent Building" aim to design a model for an intelligent system (building) controller whose intelligence is adaptation, in changing situations, according to the preferences of occupants without their intervention. Adaptation, according to Humphreys is: "If a change occurs such as to produce discomfort, people react in ways which tend to restore their comfort". Therefore, the adaptive system restores comfort to the occupants based on their preferences, it has the ability to self-regulate and adapt to the climate conditions in buildings. In order to use adaptive control a model of the building is necessary and predictive control is very important because it includes a model for future disturbances. The starting point of this work was the modeling of multisensory comfort, and, the dynamic and adaptive behavior of an occupant with his environment. A key element was to find a way to model these adaptive actions.

The paper "Design of Business Process and Message Interface for Self-Service Terminal System" develop such a combined self-service terminal system. It also give details about the design of business process and message interface on four main functional modules of the new developed system, which are uploading transaction logs, registering and configuring new self-service terminals, uploading running status, paying debts, and releasing information. Last, it conducts an experiment to evaluate the performance of the self-service terminals in terms of the packet loss rate.

In the paper "Development of a Service Robot System for a Remote Child Monitoring Platform", presents a prototype of a service robot system as a next-generation intelligent surveillance system for child monitoring. In order to achieve this, a cooperative server-client control scheme is developed that has multiple users and a remote robot that utilizes an appropriate communication method.

The Authors of "A Design of Smart RFID System for Toxic Gases Monitoring" proposed a design of smart RFID system for toxic gases monitoring. In the daily life the toxic gases that could be harm for us are hydrogen sulfide, ammonia gas, carbon monoxide, etc. Workers are very easy to be poisoned by these gases. So a rapid and low cost method of preventing toxic gases poisoning is needed. It designs a smart RFID system to monitor the concentration of different gases. Proposed system consists of smart RFID tag, humidity sensor, hydrogen sulfide sensor, ammonia sensor, reader, and server. This monitoring system can show the concentration of different toxic gases for three grades, Safe, Warning, Risk. In order to confirm the usefulness of the proposed system, it performed experiments on mackerels. With the smart RFID system, it estimated the concentration of toxic gases successfully.

The paper "The Impact of Carbon Tax Policy on the Carbon Emission Reduction and Profit" examined the impact of the different carbon tax policies on the carbon emission and their profits. This problem is formulated as a Stackelberg game, the manufacture is the leader, the retailer is the follower, the manufacture's optimal pricing decision and the customer purchase decisions are derived. Then the impact of carbon tax policy on these decisions and the carbon emission and the profits is also investigated. It found that carbon emission will be reduced if

the carbon tax is absorbed by the customers and the carbon footprints of unit product is relative high compared with the setting that the carbon tax is absorbed by the manufacture and the carbon footprints of unit product is relative low.

In the paper "A Multi-agent System Melting Particle Swarm Optimization and Cellular Automata for the Simulation of Kiln Landscape in Ancient JingDeZhen DongHe River Basin", simulate a multi-agent system integrating PSO and CA by combining the advantages of multi-agents, PSO and CA in time and space, and simulate the evolvement of kilns along Jingdezhen Donghe River Basin from 1271 to 1554. Compared with that of model PSO-CA, the simulation result of this new model is of richer changing hierarchy and can better reflect the whole process from the first to the last firing due to the relation between agents and the environment can dynamically modify land suitability values and transition probability threshold. Furthermore, the index Moran's I of simulation is much closer to the actual Moran's I, which can better reflect the interaction between political environment and natural environment of different dynasties with the lack of ancient GIS spatial data.

The Authors of "SOA-Based Framework for Home and Building Automation Systems (HBAS)" presented an implementation of SOA based framework for HBAS. SOA gives the flexibility to expand HBAS as well as makes it easier to compute sophisticated decision algorithms. SOA benefits will be further evident when service trend data becomes part of HBAS operational requirement. As the amount of the data and the requirement for algorithm increase, SOA for HBAS will be able to expand itself to accommodate the needs of continuous commissioning and scalable systems. The developed framework is tested using three types of heterogeneous embedded devices in order to measure their effectiveness in SOA environment.

The paper "Human Action Recognition Algorithm: Risk Notification Service on the Android Environments" proposes a human action recognition algorithm which can be efficiently applied to a real-time intelligent surveillance system. The proposed method classifies human actions into walking, sitting, standing up and unusual action like faint and falling down. Also, in the case of detecting unusual actions, it offers an alarm to smartphones to monitor the object of interest. This method models the background, obtains the difference image between input image and the modeled background image, extracts the silhouette of human object from input image and recognizes human actions. In order to recognize human actions, the proposed method uses direction vector of movement and link codes of movement dependent histogram (LC-NMDH). Firstly, NMDH is computed by dividing the motion information histogram into ten parts and saving the median value of each part. LC-NMDH is defined as the values which records a chain code of NMDH of each part.

In the paper "Research on the Evaluation Indicator System of the Integration of Enterprise Informationization and Industrialization", constructs two-oriented integration evaluation indicator system for enterprises, centered on enterprise competitiveness and based on infrastructure, single application, comprehensive integration, and collaboration and innovation. Through the evaluation of two-oriented integration degree of enterprise in Shandong Province, the indicator system has been applied with rather satisfactory practical results.

The Authors of "Proposal of the Experimental Promotional Video Model using Image Extension and Contraction, Overlay Techniques: based on augmented Reality and Virtual

Museum Concepts" studies expressive techniques for promotional videos of cultural-arts organizations, and specifically aims to propose the new video producing model based on the research of Augmented Reality technology and Virtual exhibition. Up to this day, Augmented realty is not popularized for making promotional videos, but it has potential value since this technology can be variously connected with culture contents, specially for exploring exhibitions of museums or art galleries. Therefore, this study aims to examine characteristics of the technology, and find the possibility of combining Information & communication technology with the culture contents industry, specially, for making promotional videos.

The paper "Regression Analysis for Gesture Recognition Using Passive RFID Technology in Smart Home Environments" presented the first attempt to address the problem of gesture recognition from passive RFID technology in smart environments. Before us, this technology was avoided in that field of research since it is considered too imprecise. The model it developed deal with the imprecision at many levels. First, it tries to improve the data directly collected from the RFID. Second, the localization method is adapted to the precise context of smart home. Third, the recognition method tackles the challenge of recognizing basic direction which few papers discuss in the literature. Finally, the model uses a novel method based on the correlation coefficient to perform the segmentation of a continuous stream of data.

In the paper "Study on the Construction of Smart Agricultural Demonstration Park", takes an agricultural demonstration park as an example, which is located in Lankao County, Kaifeng City, Henan Province, and builds a development model of smart agricultural demonstration park through the combination of smart technology with park planning. Smart construction of this park is divided into four modules: the smart production module, the smart leisure module, the smart retrospect module and the smart trading module. Connect pre-production, production and post-production through smart construction, contact the government, administrators, technicians, experts, the public and markets and form a smart industrial chain. Applying information technology, cloud computing, Internet and wireless communication technology to the construction of smart agricultural demonstration park will effectively improve the production and management level of the park and facilitate sustainable development of the park.

The Authors of "The System of Controlling the Robot by the Smart Phones based on the Bluetooth" proposes a project that can be used to accompany the elderly from the unique perspective. In the smart telephone, they open the software, and control the robot to do all kinds of actions. They also play table tennis with the robot. They enjoy themselves. This project finished that the operator uses the intelligent phone to control the robot to move or dance. This will be applied widely in developing the smart home system.

The paper "Mobile Gateway System for Ubiquitous System and Internet of Things Application" studies the u-healthcare system with respect to the Internet of Things (IoT) perspective. In the study, it comes up to the proposed mobile gateway interface to support the mobile devices to be a device to receive sensing information from the sensor devices. This study aims to make mobile device gateway an integrated gateway which supports heterogeneous devices. In the propose u-healthcare system, the received sensing information will be analyze using smartphone devices which will generate keywords. The keywords will then be sent to the medical expert system for analysis. The finding will then be sent to the user as final diagnosis of the health condition.

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