

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 21 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 “Study on the Background Extraction of Traffic Video in Smart City”, introduced the way of modeling for background with single Gaussian model and a simple experimental system for the background extraction in traffic video is designed and realized. Furthermore, defects of Gaussian model in practical application are improved.

Paper “Energy Efficiency Improvement of the of a Cluster Head Selection for Wireless Sensor Networks” observed the cluster-based wireless sensor network to configure and maintain the network topology in the routing scheme and the cluster are used also to configure the network LEACH, EACHS, HEED methods. LEACH had fixed function equation to select the cluster head and that has imbalanced energy consumption. EACHS has a disadvantage that requires identifying the residual energy of nodes and HEED has defect that it cannot guarantee the number of the cluster head. Due to these problems, imbalanced energy consumption has been occurred and the DEAD nodes were found quickly. In this paper, by selecting the cluster head more efficiently in wireless sensor network to guarantee the number of the cluster head and with varying the initial energy, it presents the normal nodes and advance nodes.

The paper “Active Omni-directional Piezoelectric Energy Harvesting System for Wireless Monitoring on Electrical Traction Shearer” proposed a novel wireless monitoring system based on Piezoelectric Energy Harvesting (PEH) and Wireless Sensor Network (WSN) to realize self-powered and intelligent detection of electrical traction shearer.

The Author of “A Group mobility oriented History information based Light Location Service” proposes the use of mobility features of groups on network nodes to utilize the location service framework which is based on historical information together with clustering mechanism to curtail the information amount saved by single nodes in the local location database, optimizing individual node’s memory overhead and the initialized load of location service protocol. Both higher service success ratio and lower load are enabled in the massive mobile Ad Hoc network.

Paper “A Proposed Scheme for City Family Health Information System” presents a proposed scheme of City Family Health Information System (CFHIS). According to investigation, it have found out lots of drawbacks in the existing Electronic Healthcare Records. Here puts forward a scheme of CFHIS to give a solution to the problems like information isolation, dead data and fluent population management with technologies as follows: system hierarchical

model, SOA-based Web Service platform, heterogeneous data integration, data exchange platform, multi-level data center, data warehouse, dynamic data updating, knowledge service model, portal service, etc.

The paper “Energy Efficient Topology Control Protocol for Wireless Sensor Networks” deals with the topology control problem by adjusting the transition radius of the sensor nodes. It produce a cluster-based topology control scheme and propose a new Energy Efficient Topology Control Protocol called EETCP. In this protocol, proper transition radius can be determined using Harmony Search (HS) algorithm. The proposed protocol dynamically adjusts transition radius of nodes (unlike some previous protocols which should select radius values among predefined values). Thus, the proposed protocol has some advantage compared to the previous protocols. EETCP has less average number of neighbors compared to the existing protocols. Also, the energy consumption in EETCP is less than other protocols and the network lifetime will be prolonged. In addition, the network connectivity in EETCP is in the acceptable level. The proposed protocol is simulated and the above advantages are demonstrated by the simulation results.

The Authors of “A Multiple Mobile Robots Path planning Algorithm Based on A-star and Dijkstra Algorithm” proposed a multiple mobile robots path planning algorithm based on A-star and Dijkstra algorithm. In addition, for the needs of practical engineering, A-star and Dijkstra algorithm has been optimized respectively.

The paper “Semantic-element-based Defining Approach for Model Transformation Rules” proposed model mapping approach based on semantic consistency. Based on the idea of elements in source semantic domain being reconstructed in the target semantic domain, this approach can be used to build mapping relations from source model to target model. Target semantic model is considered as a reference for disambiguation, and which can provide a good basis for the semantic comparison between modeling languages at different abstract levels (such as UML and target codes).

Paper “Research on Workflow-based Modeling Method of Product Manufacturing Process” put forward the method of productions’ manufacturing process model that is based on work flow, with the developing of the technology of manufacturing cell turning into intelligence. The model of product manufacturing process which was based on the process model defined by the workflow standard was expanded. It was not only to reflect the structure of manufacturing process, but also to describe the dynamic distribution of manufacturing resource in the manufacturing process. The methods and correlations of the modeling of production procedure process, the dynamic modeling of manufacturing resource and the modeling of product manufacturing process were expounded in details.

In the paper “The Design and Implementation of the Integrated Model of the Advertisement and Remote Control System for an Elevator” proposed the methods of the configuration for the notification, advertisement and remote control of the elevators that has inner network environment for the elevator to solve the lack of IP and can remain connected status immediately and send the reason of the fault to the field engineer using the cloud messaging service so that the engineer can control the problem of the elevator at real time remotely. And also it proposed the approach of the advertisement service. The proposed system will be responding to the passenger accidents quickly and will be able to build more reliable and secure environment of elevator maintenance.

In the paper “Fire Risk Assessment of Transmission Line Based on BP Neural Network” suggested a BP neural network-based risk assessment method for forest fire of transmission lines. This method is applied to build assessment index system, to establish nonlinear relationships between factors and risk grades based on BP network model, and finally to assess forest fire risk in an area of Shanxi province.

The Authors of “Main Factors Affecting the Online Service Satisfaction-an Empirical Study in China” attempt to identify the main factors affecting the online service satisfaction of the e-commerce websites in China, and Fisher’s exact test is applied to identify the main affecting factors of online service satisfaction.

Paper “Artificial Neural Network based Short Term Load Forecasting” describes the analyzing of the relationships which are concern with load demand and proposed the improved an Artificial Neural Network (ANN) based non-linear model for 24-hour-ahead load forecasting.

The paper “Multi-armed Bandit Online Learning Based on POMDP in Cognitive Radio” proposed a new algorithm if the authorized user exists in the current channel, Second user will send conservatively in low rate, or send aggressively. When sending conservatively, the state of the channel is not directly observable, the problem turns out to be Partially Observable Markov Decision Process (POMDP).It first establish the optimal threshold when the channel is known, then consider the optimal transmission when the channel is unknown and model for multi-armed bandit. It gets the optimal K-conservative policy through the UCB algorithm and improves the convergence speed by UCB-TUNED algorithm.

In the paper “A Bidirectional Contactless Power Transfer System Based on Quantum Modulation”, presented a bidirectional contactless power transfer system for wireless vehicle charger based on quantum modulation method. By applying this novel amplitude modulation method, switching losses and electromagnetic noise are greatly reduced and the whole system efficiency increased as well. Firstly, the operational principle of the contactless power transfer system is reviewed. The frequency analysis of the contactless power transfer system based on series resonant converter is deduced in detail. Besides, the voltage gain and phase feature of resonant tank are shown. Then, the quantum method for bidirectional power flow is explained in detail. The controller framework based on a simple analogous circuit is analysed as well. In additional, a simulation of the bidirectional contactless power transfer system based on quantum modulation by computer is presented to demonstrate the effectiveness of this method.

The Authors of “A Fuzzy AHP based Multi-criteria Decision-making Model to Select a Cloud Service” presents a fuzzy analytic hierarchy process (AHP) based multi-criteria decision-making model to choose a suitable cloud service provider for companies’ users. In order to achieve this goal, the multiple criteria to select a cloud service provider were determined and then compared according to their importance. Finally the cloud service providers were evaluated to select the best cloud service provider according to the predetermined criteria. In this study, the fuzzy AHP, a fuzzy extension of the multi-criteria decision-making technique AHP, was used to compare these cloud service providers.

Paper “The Positioning Algorithm Research for Forest Fire Prediction” introduced a new algorithm based on improvement of gravity center scan method in order to precisely predict

the location of forest fire. The new algorithm suppressed error rate of InToOut and OutToIn. By using the neighbor nodes around the unknown nodes, it solved the problem of less signal flag nodes around unknown nodes, furthermore, it improved the coverage of nodes and suppressed error rate the location of node.

In the Paper “Personal Health Care Management System Developed under ISO/IEEE 11073 with Bluetooth HDP” developed a smart phone based health monitoring system under ISO/IEEE11073 and Bluetooth HDP. Here it report the implementation details of HDP Manager that can be used for personal health monitoring with smart phones based on Bluetooth HDP through HDP agent simulator based on ISO/IEEE 11073 PHD. The gateway in the system is based on HL7 converter. The system is designed for applying to all PHDs based on Bluetooth HDP authorized by CHA (Continua Health Alliance). While there has been a great amount of similar efforts to build a health monitoring system under ISO/IEEE 11073, Android smart phone systems allow only after ICS version announced in 2012 thus this effort is to enhance the interoperability between HDP and smart phones.

The Authors of “Study on Parameter Optimization of Concave Disc Copying Icebreaking Snow Sweeper” developed the concave disc copying icebreaking sweeper the machine can simultaneously complete shredding, crushing, tilt, scrape and push five functions, and has the function of copying and obstacle avoidance, according to the test finds that the copying and obstacle effect is good and efficiently solves the problem of the low free rate of solid ice and snow clearing while improving the efficiency of snow clearing.

Paper “Characteristic Analysis of Peak Load in Electricity on Large Scale Hotels Considering the Energy Efficiency” is intended to analyze the possibility of reducing the entire electricity load and electricity peak load through an improvement in the energy efficiency of hotels buildings that are typical high energy consuming buildings, and to propose a plan to reduce electricity peak load through a decrease in the entire electricity load. Using the electricity load data of the hotel buildings, the properties of electricity load and the correlations between building energy efficiency rating and electricity peak load were analyzed.

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**Editors of the May Issue on
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