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 & Engineering Research Support soCiety.

This issue contains 32 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.

The paper "The Study of Current Mode Rectifier Control Technology" analyzed PWM converter with current mode control is analyzed and designed. Morever, a loop-locked control strategy is put forward based on dq coordinate conversion to SVPWM converters in the power accumulator battery testing system. Low ripple and fast response testing current in a wide adjustable range is achieved, and high power factor is obtained. Considering resonance of LC filter, the passive damping is designed, which is based on the series resistance of capacitor. Simulation results verify the feasibility and validity of this strategy.

The paper "A Peer Management Policy for Energy Efficiency in Mobile P2P Networks" suggests a peer management policy for mobile P2P environments with high degrees of mobility which is designed to increase the efficiency of data transmission by taking sufficiently into account network characteristics and energy efficiency of mobile devices.

The paper "Low Carbon Scheduling with Iterative Ant Colony Algorithm" considers a low carbon scheduling problem in unrelated parallel machines. To solve this problem, they first establish a low carbon scheduling mathematical model. Then an iterative ant optimization algorithm is presented. Furthermore, parameters of proposed iterative ant optimization algorithm are selected by Taguchi methods on generating test dataset. Finally, comparative experiments indicate the proposed iterative ant optimization algorithm has better performance on minimizing energy consumption as well as total tardiness.

In the paper "An Inexact Two-Stage Stochastic Programming Model for Sustainable Utilization of Water Resource in Dalian City", an inexact two-stage stochastic programing model was applied to sustainable utilization of water resource under uncertainty in Dalian city. The developed model, integrated the two-stage stochastic programing and inexact optimization, could deal with uncertain problems expressed as probability distributions and discrete intervals. After formulating the model, a hypothetical case based on the comprehensive planning of sustainable utilization of water resource in Dalian city was employed for demonstrating its application in the three different planning year, which was 2015, 2020, 2030. The optimal allocation of water resource with maximized system benefit among different users had been obtained.

The paper "Agent-Based Context-Aware Architecture for a Smart Living Room" states that technology that is moving beyond the personal computer towards a trend of embedded microprocessors in everyday objects and home appliances. The recent advances in sensor networks and devices with computing ability have provided us the necessary technology to make smart spaces. In such spaces, user activity and behavior are taken into account in order to provide adequate and accurate adapted services to the

current context. Services are provided proactively (without explicit user intervention) and in an unobtrusive manner. The main objective of smart spaces is to provide services to the user for improved comfort, energy savings, security, and tremendous benefits for elderly persons living alone or persons with disabilities. Despite the interesting number of proposed architecture for building smart spaces, there still exists a lack of a generic software architecture for the development of such spaces. The major weakness of proposed architecture is that they have not dealt in depth with context-awareness, which is a key feature especially in context-aware services adaptation in smart spaces. In this paper, they propose a multi-agent architecture for building a smart living room with a focus on context-awareness aspects. The proposed architecture is generic enough to be easily used in any smart space.

In the study “Experimental Research on the Influence of Tool Material and Geometric Parameters on Cutting Surface Quality of Super Alloy”, for nickel base superalloy GH4169 that is investigated in the process of machining tool is easy to wear，cold-setting severe deformation, surface quality is difficult to guarantee and so on, using different carbide cutting tools and different tool geometry parameters, nickel-based superalloy GH4169 be turning experiments. The cutting tool material, cutting tool rake angle and corner radius of the influence law of super alloy surface roughness, different tool wear condition analysis. Results show that using K313, KC5510, SM1105 three kinds of cutting tool materials processing, the difference of obtained surface roughness is not big, but for the tool wear condition, the rake face and rear face wear of KC5510 is small. Integrated tool wear and workpiece machined surface quality, in the selection of the four tool materials, KC5510 is more suitable for processing GH4169; Single factor experiments found that with the gradual increase in rake angle and the corner radius, the surface roughness gradually decreases. Therefore, when GH4169 be turning, in order to reduce the surface roughness, grain refinement should be used, together with the PVD TiAlN coating carbide cutting tools, while a larger rake angle and corner radius are selected.

The research work “Techno-Economic Evaluation of the Centralized Hybrid Renewable Energy Systems for Off-Grid Rural Electrification” will provide an assessment of the renewable energy potential of the Baluchistan region. A comparison of the economic and financial analysis for a centralized hybrid renewable energy system has been simulated by using Homer software. Three cases have been proposed in which centralized standalone solar PV system, centralized standalone wind energy system and a hybrid combination of both centralized standalone solar and wind energy system have been studied. Homer software has been used to devise the most optimal solution.

The study “Design and Implementation of Livestock House Environmental Perception System Based on Wireless Sensor Networks” designs a set of livestock house(LH) environmental perception system based on wireless sensor networks in order to monitor the six factors which is the most crucial influence on livestock production in livestock house, this paper. This system is composed by a number of data acquisition nodes(DAN) connected by using Wireless Sensor Networks. Inside of DAN is equipped with six type of sensor which in charge of collecting Real-time environmental data in LH, including carbon dioxide sensor, ammonia gas sensor, illumination sensor, relative humidity sensor and so on. The communication mode between upper-computer and central node is GPRS, to research on remotely control environmental parameters in LH in the future. The upper-computer could treat data which is uploaded by several central nodes through some way, for example, data analysis based on established protocol, threshold judgment, etc. Then, the real-time data is stored by database. The stability and veracity of the system was verified by field tests which set technical grade monitors as control groups. Comparing

with industrial-grade high precision monitoring instruments, the error of collecting data and wireless communication network is within normal error range, By SPSS, the result shows that there is no significant difference of P-Value(P>0.05) in different groups at same time.

Authors of the paper "Study on Multi Objective Optimization Method and It Application in Aviation and Deceleration Device" propose a new multi-objective differential evolution (MODE) variant, named improved double population differential cultural particle swarm optimization algorithm, inspired by improved strategy based on algorithm fusion. From the characteristics of cultural algorithm and particle swarm optimization (pso) algorithm, considering the advantages and disadvantages of both algorithms have strong complementarily. In the process of the evolution of the belief space, the strategy of "multi - layer space, the best choice" is adopted. In the process of the evolution of the group space, using the improved double group evolution difference method. To avoid a large number of high fitness infeasible solutions are discarded and the results of the algorithm are not ideal, and the convergence speed of the algorithm is improved. Multi objective optimization design of micro small speed reduction device for Aviation Based on CPSA.By comparison with the original design, the characteristics of the new design scheme are greatly improved. It is suggested that this paper proposed the method of multi objective optimization design based on the improved double population differential and multi layer culture particle swarm optimization is feasible.

The paper "Research on the Development Efficiency of Family Farm based on DEA Model: A Case Study" first describes the individual characteristics of the family farm operators, the size of the land and the circulation of the farm, the situation of the farm to obtain funds and information services. Then they estimate the development efficiency based on the DEA model, by using the survey data. The results show that family farm business process is lack of new agricultural technologies; family farmers' management ability is weak, the factors of production inputs such as unreasonable causes share of the family farm in Northeast DEA efficiency is low. In order to develop the efficiency of the family farm, government should put forward and optimize the land circulation system, pay attention to the quality of the family farmers, and improve the agricultural technology extension system, optimize the allocation of production factors.

The paper "Improvement Metaheuristic for the Time Dependent Vehicle Routing Problem Based on Simulated Annealing" defines time dependent vehicle routing problem (TDVRP) as a vehicle fleet of fixed capacities serves customers of fixed demands from a central depot with consideration of road networks conditions. The travel time between two customers or between customer and the depot depends on the distance of the two points and time of a day. A mathematical model is formulated for the TDVRP problem and a simulated annealing (SA) based improvement method is proposed for solving it. The main objective is to minimize the number of vehicles and the second objective is to minimize the total travel distance of the vehicles. The proposed approach was tested on the 56 test problems with 100 customers from Figliozzi's benchmark, and results show that the improvement metaheuristic could get better solutions than Figliozzi's algorithm in the different time dependent speeds function within an accepted computational time.

In the paper entitled "Study on a Novel Data Classification Method Based on Improved GA and SVM Model" introduced an improved genetic algorithm(IGA) in order to propose a new classification(IGASVM) method based on combining improved GA and SVM model. In the proposed IGASVM method, the self-adaptive control parameter strategy and improving convergence speed strategy are introduced into the GA to keep the diversity of the population, promptly reflect the premature convergence of the individual

and escape from the local optimal solution for improving the search performance. Then the improved GA is used to optimize and determine the parameters of the SVM model in order to improve the learning ability and generalization ability of the SVM model for obtaining new classification (IGASVM) method. Finally, the experiment data is selected to test the effectiveness of the proposed IGASVM method.

Paper "Geotourism as a Strategy of Geosite Empowerment Towards the Tourism Sustainability in Gunungkidul Regency, Indonesia" talks about the enactment of the region of Mount Sewu as a Global Geopark Network (GNN) on 19 September 2015 has given a responsibility for governments and communities to develop this region with a proper concept. The karst of Mount Sewu surrounding the Gunungkidul Regency, Wonogiri Regency and Pacitan Regency is one of the most well-known karst regions in Java Island for its uniqueness. Geoheritage and social-cultural wealth in this region becomes the base of its enactment as GGN. This study presents geotourism as a strategy of geosite empowerment towards the tourism sustainability in Gunungkidul regency. It is found that the Geotourism development comes to be an appropriate strategy in developing 13 geosites in Gunungkidul for fulfilling the directive of the policy on the local and national tourism development, demands of the development trend towards the tourism interest among community and the directive of GGN in accordance with the concept as outlined in UNESCO. The directive of the development of this geotourism has been formulated through a synthesis of various analyses including the analysis of government, analysis of potential tourist attraction, and SWOT analysis. The dialogue from a variety of analyses required to produce the formula of geotourism development of various analyses is needed to guarantee the production of a formulation of the proper and synergic directive for the geotourism development analysis necessary to guarantee the formulation of appropriate and synergic Geotourism development with various existing development guidelines.

Authors of the paper "The Synchronization Design and Implementation of LTE-Advanced Real-Time Test Platform Based on Software Defined Radio" choose GNU Radio and Universal Software Radio Peripheral (USRP) to construct a test platform for mobile communication technologies based on SDR. With the platform, a real communication conforming to LTE-Advanced physical layer specification is implemented by the PSS/SSS of LTE radio frame. The platform provides a tool to design, test and verify mobile communication technologies in real environment.

The study "UAV Remote Sensing Image Mosaic and Its Application in Agriculture" discusses the application of remote sensing image in agriculture, including rice lodging monitoring, diseases and pests monitoring, crop growth monitoring and crop nutrient diagnosis.
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The paper "System Management of Human Object on the Industrial Safety" studies management issues in wireless body area network for industry safety. They design human object as wireless body area network on the employee's body and propose management method for industry safety.

The study "Research on the Application of Building Information Model Technology in the Design of Urban Residential Buildings in Cold Region" is based on the engineering projects; the planning, the design of building facade, collision detection optimization and the full participation of construction cost control in building information model provide a new train of thoughts and research reference for the residential design in cold region, in the context of the digital age, and to a certain extent, the study looks forward to the future urban residential design and construction industrialization prospect in the cold region .

Building information modeling technology improves the design efficiency and quality with its precise data processing and analysis, avoids the defects in design and the material waste of construction and environment pollution, significantly enhancing the pre-processing level of construction structure parts, which is in line with the energy-saving environmental protection and rural environmental construction philosophy advocated by the state, and the green building strategies of sustainable development.

Authors of the paper "Research on the Localization Algorithm of Transmitting Station Based on RSSI and GPS" presents an intelligent positioning algorithm for transmitting station. By using GPS and RSSI, the influence of RSSI value can be reduced. The advantages of multi angle positioning method and centroid localization method are combined. The algorithm required less precision positioning device, also the least square method is used to reduce the error of location in urban areas. The method is simple and convenient, and the simulation results show the practicability of the algorithm.

The paper "Analysis and Design of Gravitational Sub-Pumping Station" presents an analysis in the design of gravitational sub-pumping station in riverside road to assist the existing pumping station in that locality. Such a design can serve as a model that can be implemented to the other sections of the city. The design of this pumping station involved investigating the existing sub-pumping station in terms of its structure, financial resources, and the effect in the health of end-users, its maintenance including the traffic, operations and reduction of flood water. A conventional gravitational sub-pumping station was designed based on the conclusion that for the city of Taguig, a uniform, consistent, simple pumping station would be the most.

The paper "On Research IoT-based Intelligent Parking Management System and Its Design" introduces a Internet of Things (IoT)-based intelligent parking management system, innovatively proposes a non-source RFID card that utilizes label and sensor binding to actualize vehicle identification and to accomplish functions of vehicle entrance & exit authentication, automatic charging, and parking lot certification, eventually further enhancing the utilization, traffic efficiency and service level of parking places.

In the paper "Performance Analysis of Fuzzy based RED for Congestion Control in MANET", the active queue management (AQM) scheme i.e. random early detection (RED) AQM algorithm is modified using fuzzy logic MATLAB tool, in such a manner that the efficient and reliable performance of the network can be maintained and improved as well. The results are verified with the help of QualNet 6.1 network simulator.

In the study "Research on the Characteristics of Tourism Consumption Based on Network Data: A Urban-rural Perspective", with the rapid development of online travel industry in their country, more and more tourists begin to get travel information, booking travel products through the network. The author first analyzes the characteristics of tourism consumption demand, and finds out the key factors affecting tourism consumption based on urban and rural areas.

Authors of "Research on the Seismic Design of High-rise Steel Building Based on Security Perspective" analyze the seismic performance of high rise buildings by using finite element modeling, dynamic and static analysis. Through the static analysis of steel structure that combined with dead load, live load and wind load, the result shows that when steel support under the force, the maximum node stress mainly appears in the low-end and the ninth layer, which is located in 19, 22 axis node stress is the largest, respectively as 65.9Mpa, 62.6Mpa, it is safety and within the strength limit.

The paper "Research on the Influencing Factors of College Sports Teaching Based on Statistical Analysis" talks about the rapid progress of technology, the society puts forward higher requirements for talent cultivation. The sport teaching emphasizes student's sports experience and participation, the course content is wider, including physical, psychological and emotional health. In previous studies, people don't pay much attention to the sports teaching environment, lack of evaluation of sports teaching environment. In this paper, they first analyze the evaluation standard of classroom teaching quality, and then they analyze the factors that will influence physical education.

The study "Fault Diagnosis of Coal Mine Equipment Based on Improved GA Optimized BP Neural Network" uses chaos and reverse individual learning initialization, followed by the use of differential algorithm to operate on the optimal individual. Finally, the improved fitness function is applied to the selection operation, and the accuracy of operation is improved by mutation probability and crossover probability. The improved algorithm is applied to the BP neural network to improve the training effect.

In the study "A Hybrid Framework for Adaptive Protection of Microgrids Based on IEC 61850", a hybrid adaptive protection scheme has been proposed for protection of microgrids. Computational burden and data storage is distributed among the local controllers and the central controller. A gateway is proposed for communicating between the serial interfaced devices and the IEC 61850 process bus. Finally, a framework has been introduced for implementing the proposed hybrid protection scheme for adaptive protection of microgrids by using IEC 61850-based intelligent electronic devices (IEDs).

The paper "Analysis on the Digging of Social Network Based on User Search Behavior" comes up with social network behavior search algorithm based on Hadoop Cloud Computing, which mainly adds impact factors, time arrow and page correlation factors into digging factors so as to improve the performance of digging computing and the search efficiency. The experiment proves that the computing has good effect and has instructive significance for user analysis of Cloud Computing.

The paper "A Novel Man-Machine Command System", talks about embedded system, man-machine command system is the main way for people to use the system. The command in man-machine system often needs upgrade. It is a hard work to upgrade the old command with the new version of the command. A novel man-machine command system proposed in this paper can be used to upgrade the command system in a smooth way. The method comprises: split the embedded system into different operating states, provide two command versions (old version and new version), and attach different privileges according to system operating states and command version. According to the current operating status of the system and the privilege of the command, it is determined whether or not to execute the command and whether or not prompt information about the command to be upgraded should be shown to the user. By using the method proposed in this paper embedded software can be a smooth upgrade. The old version command can continue to use, and the progress of the new version command replacing old version command will be a smooth progress.

Authors of the paper "Evaluation on Home Fitness and Community Sports Activities Based on Network Survey" construct the evaluation system of community sports activities by using network survey. The result shows that "community sports service system" is the most important factor in primary indicators; the weight is 0.2906; while "socialization degree of community sports", "residents' sports science literacy" and "sports family" are also the important indicators. At the same time, sports features and consumption are the

key factors of home fitness. On this basis, the author puts forward some suggestions on optimizing the evaluation system of community sports activities.

The study "A Novel Analysis System for Urban Construction Information Based on Case-Based Reasoning" proposed a NASUCI (Novel Analysis System for Urban Construction Information). Using data mining technology, case-based reasoning technology, the system focused on providing better decision support for urban construction. The system is composed of user management, enterprise information management, geographical information management, construction information display, construction information management, urban construction information analysis, and comprehensive statistics. NASUCI can help urban planners from a large number of original data mining more effective information, and to provide the chart display, make the analysis of urban construction become more scientific and efficient.

The paper "FPGAs in Manufacturing (Product Inspection System): Presence/Absence Detection" presents a conceptual design for an object presence/absence detection system that will be used in the Manufacturing Industry using a Field Programmable Gate Array (FPGA). They will focus on the development of Automated Visual Inspection tools based on FPGAs.

In the title "Handoff Performance Analysis for Multihoming-based Network Mobility Scheme" proposed a multihoming-based scheme on Proxy MIP6 (PMIPv6) domain for handoff performance analysis relating to handoff delay, packet delivery ratio, as well as throughput at different number of MR, speed and time. After that, it has developed a simulation model to assess the proposed scheme as well as compared it with Network Mobility Basic Support Protocol (NEMO BSP) and multi-interfaced scheme.

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