

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 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.

In the paper “A Novel Way of BPA Calculation for Context Inference using Sensor Signals” proposed a way to determine BPA using the various signals acquired from the sensors. It described the analysis of signals detected by the sensors. The determined BPA were used for multi-sensor data fusion to infer and recognize the context targeted by a wireless sensor networks. To determine BPA, the change rate was calculated and assessed to be reflected.

In the paper “Development of Foreign Language-Based Apps for Supporting Immigrants”, suggests that foreign language-based apps can help immigrants acquire knowledge and information to live an independent life in Korea. This reluctance results from purchasing marriages, which may require substantial amount of time to build a mutual trust. In this context, multicultural support programs focused on marriage immigrants should develop online that provides more direct and easy way to approach information as well as offline programs.

Paper “Attenuation of Signal at a Tropical Location with Radiosonde Data Due to Cloud” studied the attenuation contribution due to cloud liquid water content (LWC) and attenuation contribution due to cloud ice water content at different frequencies in the tropical region. Cloud liquid water content shows a greater contribution compared to Cloud ice water content in causing attenuation of signal due to cloud in troposphere.

The paper “A Study on the Emergency Alert Service using a Coordinates Techniques One-Time PAD in a T-DMB Environment” focuses on the research of the problem and the prevention of the catastrophe which the T-DMB Emergency Alert Message would cause by changing the contents paralyze the national communication channels during the transferring process. The T-DMB Emergency Alert which is used when the Disaster occur. Using the notice support message of that program. Protecting not just vicious attacks but forceful channel transfer rights and sending coded no-public certification information coordination method along with video. Since suing T-DMB Emergency Alert Message could give the right to transfer channels and could be moved to a different channel. So in this case all T-DMB receivers are the targets of the vicious Emergency Alert Broadcast. This paper compares the current Emergency Alert Broadcast Service which T-DMB Broadcast and the One-Time PAD based message alert which traditional service model provides.

The Author of “Picture Enhancement and Enlargement Algorithm on a Small Infrared Images” studied on filter design algorithm for image upsampling and horizontally, vertically,

or horizontally-vertically. Through the training process, the most appropriate filter coefficients are assigned to achieve a better performance. In a comparison with different sized filters and existing upsampler, it is clearly seen that bigger filter outperforms all other smaller filters in terms of both objective and visual quality..

Paper “An Innovative Approach for Regular Expression Matching Based on NoC Architecture” proposed a new regular expression (regex) matching method based on Network-on-Chip(NoC) architecture. The idea is to combine a new kind of regex matching engine implemented in hardware with NoC architecture to get a high matching rate. The Regex matching was performed by partitioning the regex into several parts to make the finite state machine (FSM) simpler. Each part of regex can be matched by an engine cell core, and each core communicates with other cores by routers on a NOC topology. This method is suitable for different rule libraries in Deep packet inspection (DPI) and is easy to change the rule library of regex stored in memory. The engine was designed and implemented based on field programming gate array (FPGA) as a prototype and a model to implement the architecture in Application-Specific Integrated Circuits (ASIC) is also discussed in this paper.

The paper “A Study on the Exhibition Design Model of the Playing Environment-based Science Museum for Preschoolers” focused on the research of exhibition design model for science museum, dedicated to preschoolers aged from 3 to 5 in their crucial developmental phase for wholesome development to help them explore intellectual curiosity through scientific play and experience. In this process, I propose exhibition design types or structures tailored to preschoolers’ science material and development features suitable for their each age group along with preferable play environment plan, and attempted to verify the direction for differentiated new hands-on education against average science museums.

The Authors of “A Study of Methods to Use Local Communities through Book Cafes” looks into cultural characteristics of book cafes emerging in the Hongdae area and methods for the effective use of cultural space through the cases of Potato Flower Studio in Gangwon-do and of the changes of two markets ‘Gwangjang Market’ and ‘Tongin Market’ in Seoul. The cultural space is generally acknowledged as a place or facility where citizens can appreciate culture and arts or they can create or educate cultural products in life. As a potential space in the cultural space of a city, book cafes should be developed into a cultural space which can be easily accessed by publishers, Korean readers, and foreigners. It is required that a book cafe acts as a local community space with its characteristics, that is, a complex culture space. To find a utilization plan for book cafes, it’s conducted a comparative study with ‘Potato Flower Studio’ in Pyeongchang, Gangwon-do which is the place connecting successfully with regional culture of the area.

The paper “A Review on Device-Free Passive Indoor Positioning Methods” presents the main technologies used for device-free passive indoor positioning, including pressure sensors, thermal infrared sensors, sound source localization, ultrasound, radio frequency, infrastructure-mediated sensing and electric-field-based methods. In addition, it compares the advantages and disadvantages of a range of positioning systems to help identify the most suitable positioning technology for specific cases.

Paper “Comparative Performance Study of Localization Schemes in Wireless Sensor Networks” reviews three typical localization schemes for WSNs and, then, compares their performance via computer simulation in terms of localization accuracy. The simulation study

shows that the probability grid localization scheme achieves the best performance with the minimum location error rate.

In the paper “Policy Perspective Analysis of Technology Adoption in Industries” demonstrates the trend of technology adoption in firms of developing countries and explores industrial landscape features. The case study of Pakistan is used for analysis, it represents the developing country of Asia. The paper used the content analysis method. The key points extracted by using the Socio-economical development indicators..

In the paper “Development of Reservation Recommendation Algorithms for Charging Electric Vehicles in Smart-Grid Cities”, propose new reservation recommendation algorithms for charging EVs while traveling, especially in Jeju-do, to prepare for EV charging reservation systems in the near future. In the proposed algorithms, it selects charging stations based on distance and route. When it recommend alternative charging stations, it provide 3 possible stations such as (i) the desired amount of battery without waiting time, (ii) the desired amount of battery with waiting time, and (iii) the limited amount of battery with waiting time.

The Authors of “Proposal of MDM Management Framework for BYOD use of Large Companies” provide a management framework of MDM security solutions for the application of this information, to prevent the outflow of internal assets in BYOD [2]. Currently, research and functional evaluation of MDM security solutions is the major. However, when introducing the MDM solutions, research management framework to reflect the characteristics of the amplifier section of the department and affiliates in the large companies, considering the technical and policy is not presented, so far the hard way are. Therefore, management framework that can be with the data collected during the analysis of the questionnaire Samsung security management existing items, to understand the need for MDM security solutions for each department and affiliated companies, to make effective use of this I will try to offer..

Paper “HMM-Based Decision Model for Smart Home Environment” proposed a productive approach called HMM-based decision making model in smart home which has an exceptional learning ability around subsystems. The effectiveness of the model is tested in real phenomena. The technique gives rise to two algorithms – specifically, Viterbi and Baum-Welch algorithm.

The paper “Survey the Interactive Broadcast Management System in Smart Devices” discusses the architecture for secure interactive broadcast management system in smart devices. It consists of 3 parts Contents Priority Handling Manager, Complicit Manager, and Delegate Manager. This is enables prevent contents from being leaked by third parties, and to minimize the damage. It is also possible to process errors and other exception handling tasks from causing the process to terminate.

In the paper “Algorithm to Differentiate Indoor MTC Devices”, develop a unified differentiating algorithm suitable for any fading channels which are characterized by the probability distribution functions of receiving envelopes. Taking Rayleigh fading channel as an example, it carries out the performance analysis of this algorithm. The influences of additional penetration loss and proportion of indoor MTC devices on the error rate of discrimination is given out. In addition, it also proposed a dedicated power compensation

mechanism with TTI bundling for indoor MTC devices to evaluate the link performance of this algorithm.

The Authors of “Vehicle Trajectory Discovery for Vehicular Wireless Networks” introduces vehicle trajectory discovery for vehicular wireless networks. Nowadays, GPS-based navigation systems are popular used for providing efficient driving paths for drivers, as well as it's still a major challenge to process such information in order to explain moving object interactions, which could help in deriving trajectory patterns.

Paper “Smart Surveillance Camera based on Pattern” focuses to remove the shadow efficiently. The computer vision researchers always give importance to the experimental issues such as image input color, morphological algorithms or moving object detection not to the real environmental issues. If the input image and shadow is similar with human then other algorithm not performs well while the proposed algorithm works very accurately.

In the Paper “A Research Using Private Cloud with IP Camera and Smartphone Video Retrieval”, designed application on smartphone was operated to save video information in designated directory, which was synced with Host's Private Cloud server, and it is found out that users can ubiquitously check whether video was saved using Private Cloud server. Also smartphone or IP Camera's video information is always stored on Private Cloud Servers, which can be used as evidences when crimes took place. Also, employees can save materials from meeting, and for corporations, it has possibilities for cooperation between employee in business trip and employee in the office using video information taken from meeting or conference synced real-time in corporation's Private Cloud Servers and monitor them.

The Authors of “A Falling Detection System with wireless sensor for the Elderly People Based on Ergnomics” established a falling detection module based on the 3D acceleration sensor, the microprocessor and the wireless communication technology. Its validity for distinguishing daily activities and falling actions has been proved through experiments. In the stage of data preprocessing, the data classification algorithm based on 1-class SVM was adopted to extract the suspicious data. Meanwhile, a creative method which is based on the difference of energy consumption in different human actions was proposed to make the final falling judgment.

Paper “The Path Search Be Applied Algorithm for Spread of Flame and Smoke in Fire Simulation” propose a fire Simulator that is applied optimal path search algorithm to arrange the quick evacuation. This simulator considers the structure of a building and the location where the fire has initially occurred, applying it to the simulator. Especially when implementing the training simulation for firefighters, optimized evacuation path for the required virtual rescuer awaiting rescue was informed to implement more realistic firefighting training simulator. For the simulation for the test, fixed data was set to apply the shortest path search algorithm and flame smoke spread algorithm.

The paper “Establishment of Surface Topography Simulation Model with Considering Vibration and Wear of Ball-end Milling” proposed new method to obtain the dynamic response of discrete points by transforming deformation of those values into work-piece coordinate system. At the same time, a new policy of retention has been proposed to avoid inadequate statistics and large number of statistics. Retaining coordinates which can effectively influence the formation of surface topography, the prediction model of surface

topography can be established with the consideration of force, wear and dynamic response on the ball-end mill.

Paper “The Conjugation Method of Augmented Reality in Museum Exhibition” deals with the study of AR technology that has a wide range of applications, and can be effectively applied to museum exhibit environments, should the need arise for information on the uses and functions of artifacts, information on the restoration of damaged artifacts, the spatial characteristics of artifacts, or objects that require the modernization of artifacts. Utilizing AR technology via mobile applications can be implemented with no additional need for hardware and system. Augmented reality (AR) technology can provide a variety of solutions to help museums fulfill their role and goals.

In the paper “A Study on the Interpretation Optimization to Improve the Performance of the Stack based Virtual Machine on Smart Platforms”, deal with two kinds of optimization technique to optimize stack based SVM which can execute on various smart devices. And, to improve performance of the SVM on execution engine aspect, it applies the one of these optimization techniques. For verification of this optimization technique, it profile and analyze performance of the original/optimized SVM. As a result of the experiments, the optimized SVM has 23~27% reduced execution times than the original SVM.

In the paper “Design of the Smart Vessel Platform using the Remote Monitoring Technique”, designed a smart vessel platform which can provide diverse marine information as well as monitor data of control systems and sensors in remote areas. The platform realized can check information on vessel through smart systems using NFC communication anywhere in a vessel.

The Authors of “Smart Parking Information System Exploiting Visible Light Communication” propose a smart parking information system exploiting visible light communication (VLC) technology to help drivers getting the real-time parking information as well as direction guide. By providing accurate information on available parking spaces, drivers save time and fuel and increase efficiency of the parking process. Therefore, the proposed system not only gives the illumination function of LED but also the function of communicating in the manner of application based on the VLC.

The paper “Effect of Urbanization on Climate Change in Nanjing” chose urbanization and climate change of Nanjing city as the research object, by using trend analysis, correlation analysis, multivariate linear regression analysis and other methods, using the climate data and social statistical data of 1951~2011 observation stations in Nanjing City, analyzing the trend of city climate change and the correlation between different parameters and main climate factors. Results show that, the warming trend in Nanjing is very weak, the mainly temperature change is a rising temperature in winter, while it was not obvious in summer, reduce the heat wave phenomenon, the average year temperature has increased slightly; over the years precipitation showed increasing trend, the sunlight hours was decreasing, in addition to the city dark island effect.

In the paper “Research on Hydrostatic Thrust Bearing Worktable Job Status”, presented idea of the hydrostatic thrust bearing pose control to improve NC machine tool precision. The bearing worktable poses by controlled by coupling oil film thickness of 4 controllable chambers. The chamber flow can be regulated by variable pump. The flow of the variable pump was controlled by electro hydraulic servo valve according to the surface roughness,

load, cutting force, and thermal effects of worktable. The mathematical models of the controllable chamber flow. The pose control model was established, which contains the kinematics positive and negative solution. The simulation experiment was carried out on the electro hydraulic servo test bench.

The Author of “A Study on the SIL Codes based Java Compiler for Supporting the Java Contents in the Smart Cross Platform” introduces a Java compiler for the Smart Cross Platform to support Java contents. Proposed compiler translates given Java programs into stack based intermediate SIL codes to execute on the SVM(Smart Virtual Machine).

Paper “Detecting Human Head and Shoulders Trajectory in a Smart Classroom” use the multimedia technology on the student's head and shoulders trajectory tracking and analysis, so as to solve the above problems, mainly divided into three phases: firstly is human face recognition, using Ababoost; secondly is to get the head and shoulders'pose, analysis to determine the effective head and shoulder trajectory; analysis and judgment on the results after using Camshift for tracking.

In the Paper “The Controller Development of Multi-layer Parking Equipment Based on STM32” design a controller based on STM32F103 series microprocessor used in Multi-layer parking equipment, with SD card, NRF and other module interface. To ensure the stability of the controller, all of the input interface, relay output interface and the power supply part are isolated, smoothed and other necessary processing; The controller can be performed RS485, CAN bus communication, also with voice alarm, LCD display.

Paper “Design of Fan Performance Detection System Based on ARM Embedded System” provides detect data for reference for enterprise's production. The fan performance detect system is based on embedded ARM, and this is an integrated system that detect and analysis the operational status of Fan performance. The detection system for fan energy provides a new technical means. It is realizing the fan system monitor each parameter real-time, reduce the traditional fan testing on the field personnel needs, and improve the fan detection accuracy of various parameters.

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**Editors of the January Issue on
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