Guest Editorial Preface

Special Issue on Innovations in Information and Communications Technologies for Sustainable Environment

Information and communication technologies are acting as integrating and enabling technologies for the economy and they profoundly affect our society. New technologies provide utilities for knowledge acquisition and awareness, early evaluation of new knowledge, reaching agreements, and communication of progress in the interest of human welfare. This special issue provides a forum for innovative findings in the development of applied software engineering and environmental information systems. It is essential to understand how to effectively transform these services into Utilities that provide value to both users and providers. The aim of this special issue is devoted to gather and present new research that addresses the challenges in the broad areas of Information and Communication Technologies for Sustainable Environment.

Therefore, the objective of this special issue is to publish high quality, original, unpublished research papers in the broad area of Information and Communications Technologies for Sustainable Environment. Thus, presents a platform to bring together researchers, practitioners, developers, environmentalists, and users who explore new ideas, techniques, and tools, as well as to exchange their experiences.

This special issue includes six papers that cover a range of aspects of Information and communication technologies for a sustainable environment, from cyber sensor model for the cyber physical social system, machine learning regression methods for agriculture, IoT based Intelligent Irrigation System, Trust-based Opportunistic Network for Smart Agriculture, Smart farming approaches and Smart agriculture and food storage system security. Each of these papers has undergone a fully double-blind peer review, prior to being selected for this special issue.

The first paper titled "Agricultural Recommendation System for Crop Using Different Machine Learning Regression Methods" by Mamata Garanayak, et. al. This paper focuses on agriculture, which has the impact of temperature variations and its uncertainty has engendered bulk of the crops to be overripe in terms of their manufacturing. A correct forecast of crop expansion takes part in a vital character in crop forecast management. Such forecasts will hold up the federated industries for accomplishing the provision of their occupation. ML is the method of finding new models from giant information sets. Numerous regressive ways like the random forest, linear regression, decision tree regression, etc. will be used for the aim. Area and production are among the meteorological information that's made by necessary data. This paper figures out the yield recommendation of the crop by the accurate comparison of numerous machines learning ML regression where the overall percentage improvement over several existing methods is 3.6%.

In the next paper titled "IoT-Based Intelligent Irrigation System for Paddy Crop Using an Internet-Controlled Water Pump" from Brij Bhushan Sharma, et. al. In this paper an irrigation system

is developed to supervise the paddy crop field using sensors (Soil moisture, pH, and flow), and this irrigation system works based on the concept of IoT, so it is known as Intelligent Irrigation System. The soil condition data from sensors are sent to the webserver database using wireless transmission and after the system decides how much water is needed. In the proposed server database, the data is saved, and the idea of a dashboard is introduced. It operates via Http protocol to control the water pump of farmland. The condition of the soil is monitored where the parameters for the measurement are moisture and flow of water amount using the IoT, which can switch on/off the water pump. The UI is developed using an open-source, namely "000webhost". This paper considered the paddy-crop i.e. rice because water plays an essential role in the growth of rice plants. Experimental results show that this system is more proficient than the existing conventional irrigation approaches.

In "Trust-Based Opportunistic Network Offloaders for Smart Agriculture" the authors' Prince Sharma, et. al., describes the trust-based solution for mobile data offloading. With the enormous use of Internet of Things based devices for enabling smart agriculture, there is a significant need for efficient systems to improve agricultural practices. In this paper, the authors target to determine such offloaders with less infrastructural costs, to enable smart agriculture based on network heuristics. Although few works contribute to the trust established, most of them are applicable only for static networks. The authors have identified the need and impact of trust determination using our Trust Model Algorithm. The proposed algorithm outperforms the Hybrid Trust based Mobility Aware Clustering algorithm for trust-based offloaders with up to 13% better offloading potential saving a minimum of 8 pJ energy per user with just 25% contributors with 50% lesser time delay.

The next paper from Hui Pang et al. is titled "Smart Farming an Approach for Disease Detection Implementing IoT and Image Processing." With the increasing demand in smart agriculture the importance of effective growth of a plant and increase its productivity is very essential. In this article, an image processing based algorithm is developed for the detection and monitoring of diseases in fruits from plantation to harvesting. The concept of an artificial neural network is employed to achieve this task. The proposed system uses two image databases, the first database is used for training of already infected images and the second for the implementation of other query images. The weight adjustment for the training database is carried out by the concept of backpropagation. The experimental results present the classification and mapping of images to their respective categories. The morphology gives 93% correct results which are more than the other two features. The designed algorithm is very effective in detecting the spread of disease.

The next comes paper from Guo Si-wen et al., titled "Smart Agriculture and Food Storage System for Asia Continent: A Step Towards Food Security." Asia is the largest and most populous continent on Earth with an overall population of 446.27 crores. In which provides healthy and nutritious food to every individual is most challenging. Unfortunately because of certain production issues, farmers are not getting the desired throughput and in some critical cases, situations lead to suicide. On the other hand, proper storage and distribution of these harvests is another challenge. Various modal and IoT (Internet of Things) based approaches have been presented and are available for implementation, but a dedicated layout combining the digitization of all the essential steps, starting from preparation of soil for agriculture to making food available for every needy person is still missing. In the proposed work various related models have been studied and an integral modal is presented where the integration of IoT is carried out with agriculture and with the food storage and distribution system.

The last paper of this special issue is titled "A Cyber Sensor Model for Cyber-Physical-Social Systems" by Olga Murdoch et al. This paper proposes a programming model for fusing information sources in Cyber-Physical-Social Systems. The heterogeneity represents a critical obstacle for system designers as they seek to harness and integrate diverse system elements to deliver innovative services. This obstacle is acutely manifested in Cyber-Physical-Social Systems when collecting and fusing data for evidence-based decision-making; social and human-derived data exacerbate the problem. Thus, the efficacy of the model is validated via a usability analysis.

As the official journal of the IGI Global Inc., IJAEIS is proud to bring you this special issue. We hope that reading these high-quality papers will inspire you to make your submissions to future conferences & journals and to support the research community.

We would like to thank all the authors who kindly contributed their papers for this issue, the Editorial Reviewer Board and Associate Editors for their timely and constructive reviews for the betterment of manuscripts. We would also like to thank the Editor-in-Chief Petraq Papajorgji and François Pinet of the International Journal of Agricultural and Environmental Information Systems (IJAEIS) for their kind help and co-operation. We are also indebted to the IGI Global editorial officers, the publishing and production teams for their consistent support in the publication of this issue.

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