Foreword and Editorial

We are very happy to publish this issue of an International Journal of Advanced Science and Technology by Science and Engineering Research Support Society.

This issue contains 11 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 “Predicting of Surface Ozone Using Artificial Neural Networks and Support Vector Machines” explored the prediction of the surface ozone layer problem. A comparison between two types of Artificial Neural Networks (ANN) (i.e. back propagation and Radial Basis Functions (RBF) networks) and the Support Vector Machines (SVM) techniques for short prediction of surface ozone is conclusively demonstrated. Three models which predict the expected values of the surface ozone based on three variables (i.e. Nitrogen-di-oxide, temperature and Relative Humidity) will be presented.

Paper “Chirp as Precompensation Factor to Reduce BER on Gaussian and Super Gaussian Pulses in OCDMA System” examine the way in which the probability of BER would be reduced by considering the chirp effect on Gaussian and Super Gaussian pulses within different conditions.

In the paper “Improvement of Blended Biodiesel Fuel Properties with Ethanol Additive”, addresses the method of an oxygenated additive ethanol (E) that added to palm oil biodiesel POME-diesel blend B50 (50% POME + 50% diesel) in the ratios of 1%, 2%, 3% and 4% and tested for their properties improvement. These blends were tested for energy content and various fuel properties according to ASTM standards. Qualifying of the effect of additive on palm biodiesel-diesel blended fuel properties can serve the researchers who work on biodiesel fuels to indicate the fuel suitability for diesel engines according to fuel standards. The results showed slight improvement in acid value, significant viscosity and density. Maximum decrease in pour point by 2 °C at 3% ethanol, on the other hand maximum decrease in energy content about 4.3% at 4% ethanol compare to blended fuel B50.

The paper “On Decomposing Systems of Boolean Functions via Ternary Matrix Cover Approach” considered the problem of two-block disjoint decomposition of completely specified Boolean functions. Recently a good method in functional decomposition category was proposed. This method is based on using the ternary matrix cover approach. Due to investigation and analysis of this method and to search for an appropriate partition, a
computer program was developed. After running the program on thousands of systems of Boolean functions, experimental results show that more than 95% of the inspected systems are decomposable. To obtain a solution of the task in decomposable systems, an efficient technique is also proposed. Using this technique, investigation of one partition was enough to determine decomposability of the inspected systems.

The paper “Multisensor Data Fusion Algorithm using Factor Analysis Method” presents an algorithm that is employed to fuse data obtained from accelerometer and gyroscope in an inertial measurement unit (IMU). The proposed algorithm is developed based on decentralized data fusion notion that facilitates to study effect of noise parameter associated with individual sensors. Feature extraction and processing is accomplished using factor analysis model. Factor analysis is a statistical method used to study the effect and interdependence of various factors within a system. The performance of the algorithm is illustrated via computer simulations and compared with well-known Kalman filter algorithm.

Paper “Influence of Polymer Fiber on Strength of Concrete” outlines an experimental study that measures the effects of polymer fiber on proprieties of concrete. However, polymer fiber may serve as a superplasticizer admixture which may result to concrete’s lower rate of water absorption, high-range water reducer, greater strength and excellent in elasticity. Hence, an experimental investigation was conducted to determine the optimum dosage for the admixtures and to study the effect of over dosage of the mentioned admixtures. This elastic property of the polymer fiber reinforced in cement-concrete mix may produce better earthquake resistance of the building or structure as it deflects for a while as the load is applied and then returns to its original position as the load is removed. The experiments made were concrete with polymer fiber (polyvinyl alcohol, polyvinyl acetate) as the experimental group and a standard concrete mix being the control group. Polymer fiber used has been dissolved in water with five different proportions ranging from 2% to 10% with respect to cement’s percent by weight in kg. This specimen is molded in a cylinder with constant volume of cement, sand and gravel at 1:2:4 mix proportion of class “A”. The specimens formed were cured and tested to compressive strength on the 7th, 14th and 28th days after curing. Results prove that concrete mix having polymer fiber gave greater strength results than the standard mix.

This paper “Estimation of Location and Scale Parameters of Weibull Distribution Using Generalized Order Statistics under Type II Singly and Doubly Censored Data” discussed the estimation of location and scale parameters of Weibull distribution using concept of generalized order statistics by the best linear unbiased estimator (BLUE) and an alternative linear estimates (Gupta) from Type II singly and doubly censored samples. Tables of coefficients for best linear estimator and alternative estimator of $\mu$ and $\lambda$ have been obtained for various choices of censoring using $n \leq 8$. Variances and covariances of estimators of $\mu$ and $\lambda$ based on BLUE and Gupta methods have also been presented. The computational
formula and procedure used have been explained. The efficiencies of the two estimation methods have been compared under a simulation study. The findings of the study suggest that the Gupta method can be replaced by Lloyd’s method which is useful when it has knowledge about the expectations and not about variance covariance matrix.

In the paper “Data Reduction of ICU Data using a Random Selection Approach” presents a machine learning technique called random selection to reduce ICU data sets. It will show that this technique derives trends in ICU data sets to enable qualitative reasoning as part of a clinical decision support.

This paper “Adaptive Neuro-Fuzzy Inference System for Health Monitoring at Home” introduces that Healthcare is approaching a critical situation. The ageing of population is increasing the prevalence of chronic diseases. Cardiovascular and respiratory diseases not only kill hundreds of thousands of people each year around the globe but also cost billions of dollars. Patients have to make frequent visits to their doctor to get their vital signs measured. People in remote places are deprived of proper healthcare. Hence, there is a need to develop a system which will help in reducing the frequent visits to the clinic and also help in early diagnosis of dangerous diseases. A system must be targeted both for monitoring elderly and for monitoring rehabilitation after hospitalization period and at the same time economically efficient. This paper presents our initial attempts to develop such a system with the help of Adaptive Neuro-Fuzzy Inference System (ANFIS) by adaptive learning mechanism. The MATLAB simulation results indicate that the performance of the ANFIS approach is much important and at the same time easy to implement.

Paper “Topology Control Protocol for Maximizing Network Lifetime of Wireless Sensor Networks” discusses the optimizing and enhancing network lifetime with minimum energy consumption is the major challenge in field of wireless sensor networks. Existing techniques for optimizing network lifetime are based on exploiting node redundancy, adaptive radio transmission power and topology control. Topology control protocols have a significant impact on network lifetime, available energy and connectivity. In this paper it categorize sensor nodes as strong and weak nodes based on their residual energy as well as operational lifetime and propose a Maximizing Network lifetime Operator (MLTO) that defines cluster based topology control mechanism to enhance network lifetime while guarantying the minimum energy consumption and minimum delay. Extensive simulations in Java-Simulator (J-Sim) show that our proposed operator outperforms the existing protocols in terms of various performance metrics life network lifetime, average delay and minimizes energy utilization.

In the paper “Application of Target Point Detection Technique for Positioning and Assembling of Ship Blocks” presents the algorithm for target point detection using image based methods and sensor networks to monitor the accuracy control for assembling ship
blocks in a ship yard area. Dimensional control of the product at all assembling level accounts for a profitable ship production. An accuracy error at each stage accumulates to a higher value which leads to low level of ship productivity. The implementation of the image based method will enhance the monitoring system to increase the ships productivity while reducing the reworks and manual adjustments. To efficiently measure the distance between two ship blocks in real time, sensor nodes are used and the data is transferred to the monitoring server by wireless network. In order to get the correct assembling position of the ship blocks, the target points of the ship blocks to be assembled together are detected and analyzed to decide the next step for the control system. Thus as the distance is received by the server, the next direction of movement is directed through simulation results of target detection and analysis. The final process of shield wedding is done once approved by the end observer.

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