Editorial Notes

Welcome to International Journal of Technology

Theme: Integrated Design in Urban Eco-Technology for Quality of Life and Humanity

Sustainable development requires the implementation of appropriate environmentally friendly technologies which are both efficient and adapted to local conditions. In this situation, eco-technology practices can facilitate to conserve and restore the environment through the integration of engineering and ecological principles. With this paradigm, eco-technology requires multidisciplinary synthesis of knowledge and skills, also the development and application of eco-technology in the sector of industry and services is therefore a crucial requirement for sustainable development process.

This season, we are pleased to present the special edition of International Journal of Technology (IJTech) dedicated to systematic and empirical research on integrated design in urban eco-technology. This special edition presents ten selected papers from the 12th International Conference on Quality in Research (QiR 2011) in Bali, Indonesia. With this theme, this special issue focuses on the scientific analysis and design of key factors explaining success applications of integrated design in urban eco-technology, their market perspectives, and their contributions to the existing and future development of humanity.

The first paper, written by Y. Chen, C. Feng, Y. Wang, and H. Wu, presents a model-based planning system that employs Building information model (BIM), object sequencing matrix (OSM), and genetic algorithms (GAs) to obtain an optimal crew assignment under resource and workspace constraints. The model is purposed to evaluate a construction project costs and optimize temporal distribution of resources in project planning by using Cost/Schedule Integrated Planning System (CSIPS). The proposed CSIPS system has demonstrated the efficiency and feasibility in project planning and control by reducing overhead efforts, errors, and improving project performance.

Furthermore, K. Cho, S. Jeong, and D.P. Sari evaluate the application of Building Integrated Wind Turbine (BIWT) as a green building icon and method of assessing optimal building energy by considering building design shape and swept area in order to increase wind velocity. Some of numerous designs of BIWT have been evaluated using CFD (Computational Fluid Dynamics) analysis to find the most effective BIWT design in urban area. The result shows that building energy can be optimized through aerodynamic design of building to achieve maximum wind power for building energy consumption.

The third paper, written by Budiyanto, R. Setiabudy, E.A. Setiawan, and U.B. Sudibyo, proposes the design of an electric power supply control to regulate renewable energy in a direct current (DC) microgrid. The microgrid combines electrical power supplied from several renewable energy power plants and it can be operated as an isolated distribution network or can be connected to the utility grid, PLN. In this research, a control device for a 254-volt direct current microgrid supplied by a solar cell, a wind turbine, and a battery energy-storage system is discussed as a potential solution toward ensuring a stable supply to the microgrid, even when the energy sources supply reduced power or no power at all.

The fourth paper, written by W. Brontowiyono, R. Lupiyanto, D. Wijaya, and J. Hamidin, presents the efforts to decrease temperature of the city by establishing green open space (GOS). By applying GIS analysis with overlay technique, the result shows that there are 38.82% areas which have low priority, 32.38% of middle priority, and 28.80% of very high priority to be developed as GOS, such as City Park, green-path line, city forest, etc.

The fifth paper, written by K. Murata and H. Katayama, presents a design of support system of Kaizen activity in manufacturing/production department. The research employs Decision Support System (DSS) which consist of three elements, i.e. Kaizen Case-based, Model-based and User-interface. First element accumulates useful cases to develop a new case. Second element accumulates models to utilize the Case-based effectively. It includes four kinds of models, such as Kaizen strategic model, Kaizen objective model, Kaizen data analysis model, and model building blocks and subroutine. The third element gives a linkage structure among Kaizen Case-based, Model-based, and Kaizen engineers.

The sixth paper, written by I.S. Thakur and S. Srivastava, presents the analysis of substitute materials for tanning in leather mills industry. The current use of Chromium sulphate, Cr(III) and pentachlorophenol (PCP) as tanning and biocide respectively in leather preparation are argued as highly toxic and recalcitrant. The evaluation of biosorption of chromium by Aspergillus niger FIST1 and optimization of process parameters in presence of carbon, nitrogen, carbon:nitrogen, pH, temperature, different concentration of chromium are also discussed. The test on bioremediation of chromium and PCP in bioreactors in sequential way shows a reduction of chromium (82%) and PCP (85%) after 120 hrs. The results indicates that quality of the leather prepared by absorbed chromium of fungus and bacteria is better than chromium recovered by CaO:MgO.

The next paper, written by N. Mohd-Ghazali, M. Anwar, and N.H.M.A. Settar, examines the use of a portable counter-top thermoacoustic cooling without refrigerant. By using no refrigerant or compressor, cooling was actually achieved when acoustic waves generated by a loud-speaker go into an air-filled cylindrical tube. Based on a standing wave resonator tube, the system with a pvc resonator tube of 60 mm diameter, which was initially at 24^{o}C, accomplished a cooling effect under one minute, up to 18.5^{o}C, without using chlrofluorocarbons (CFCs) or other similar refrigerants. Another acrylic 110 mm diameter tube once recorded 8^{o}C with the ambient held at 23^{o}C.

The eighth paper, written by Fauzun, M. Hamdi, and T. Ariga, presents the influence of the base metal surface roughness on the BAg-8 spreading behavior. The filler metal was melted at 830^{o}C for 15 minutes on a S50C surface with various roughness levels. After solidified, the spreading area was observed and characterized in macro and micro scale. The result shows that by increasing the surface roughness, it tends to increase the capillarity effect and to decrease the imbalance in surface tension of the molten filler. The optimum surface roughness is obtained at Rz = 0.92 where the ratio as well as the fitness of the true spreading with initial condition of the filler are optimized.

The ninth paper, written by T. Seo, B. Song, K. Seo, J. Cho, and G. Yoon, presents an optimization of machining conditions in micro end-milling by using response surface design. The researchers use axial depth of cut and radial depth of cut as design factors among cutting conditions, such as spindle RPM, feed rate, axial depth of cut and radial depth of cut by using a 3-axis micro machining system. Choosing interval of machining errors as a criterion for machining quality, an approximate model is established by using a "response surface design". The values of axial depth of cut, Ad, are chosen in the range of 200~300μm and the values of radial depth of cut, Rd, are chosen in the range of 10~90μm. After determining the optimized micro end-milling conditions with the values chosen, Ad = 227, Rd = 74, and response value Werr = 10.1, are considered as optimal condition.

The last paper, written by T. Nakano and K. Saito, presents the development of general-purpose energy system simulation for solar collector and radiation via internet. The simulator consists of five elements: data input, calculation control, system calculation, element calculation, and data output. It will be seen from the simulation the range of decline in efficiency in connection with decrease in solar radiation caused by reduced heat loss in ambient temperature.

I hope that this special edition of IJTech conveys some new insights in the way we conduct our research. I am pleased to accept and respond to any comment and enquiry you may have on the direction and content of IJTech and I invite you to join us in this venture by sending your work for consideration.

With warmest regards from editorial desk,

Dr. Mohammed Ali Berawi
Editor-in-Chief
International Journal of Technology