Editorial Notes

Welcome to International Journal of Technology

Theme: Creating Value through Engineering Design and Technology

This season, we are pleased to present the second edition of International Journal of Technology (IJTech), an international peer-reviewed journal dedicated to systematic and empirical research in the areas of engineering design and technology. The theme for this issue is chosen to describe rigorous processes and methods in various engineering fields with the intention to create innovative solutions and enhance product value.

Creating value through engineering design and technology is the means for improving product or project value by generating innovative products and services, reducing or even eliminating the negative undesired consequences, optimizing the performance, and advancing the sustainability of the product/project. In order to achieve this, industries are required to conceptualize their values as a tool to develop an effective, efficient, and robust process.

Based on the 2010 Renewable Energy Conference in Berlin, the 4th Indonesia-Japan Joint Scientific Symposium 2010, and journal submission, the second edition of IJTech presents ten selected papers to stimulate debate and to explore the application of engineering design and technology in creating value.

The first paper, written by H. Arimoto, N. Takeuchi, S. Mukaihara, T. Kimura, R. Kano, T. Ohira, S. Kawashima, and K. Iwakura, examines the applicability of Tunable diode laser absorption spectroscopy (TDLAS) gas detection technique to control combustion and monitor emission under harsh environment. The authors examine, further, laser modulation spectroscopy technique utilizing frequency modulation spectroscopy (FMS) and wavelength modulation spectroscopy (WMS) and its practical applicability through a comparison between laboratory experimental results and theoretical calculations using molecular spectroscopic database.

Furthermore, P. J. Ramadhansyah, B. H. Abu Bakar, M. J. Megat Azmi, and M. H. Wan Ibrahim, evaluates the effect of rice husk ash with different grinding time on the engineering properties of concrete. Rice husk ash is used to partially replace Portland cement Type I at 15% by weight of cementitious material. Based on the result, the morphology of the rice husk ash is changed by grinding and grinding of at least approximately 90 minutes appears to be the optimum time that increases the compressive strength significantly.

The third paper, written by T. Kumagai, K. Saito, M. Takahashi, and K. Ito, provides an evaluation on wireless power transmission as a mean to operate tiny medical equipments, such as capsular endoscope, that will be in the body of a subject for a long period during diagnosis stage. A modified helical antenna inside the endoscope is proposed as a power receiving antenna that operates at 915 MHz. By calculating the maximum power received in the stomach using such antenna, the result shows that sufficient power is well received by the equipment.

The fourth paper, written by Suwarno, presents the modification of lithium borohydride for mobile hydrogen storage. This paper investigates the influences of fluorine containing compounds, TiF_4 and ZrF_4, on hydrogen sorption properties of $LiBH_4$. Thermovolumetric measurements, titration, and XRD technique are used to characterize samples. The results demonstrate a pronounced beneficial effect of both ZrF_4 and TiF_4 on the sorption properties of modified $LiBH_4$ in terms of thermodynamic and kinetic properties.

The fifth paper, written by M.M. Julian, F. Nishio, Poerbandono, and P.J. Ward outline a simulation of river discharges in several major watersheds in Northwestern Java, Indonesia. The discharge simulation is carried out using STREAM (Spatial Tools for River Basins and Environment and Analysis of Management Options). The result shows that over the course of the 20^{th} century and early decade of the 21^{st} century, monthly discharges of those watersheds have increased by 3-9%.

The sixth paper, written by M. Elfani, presents the impact of renewable energy development in the creation of job opportunities in Indonesia. Based on the applicable policies, possible green jobs creation, and the number of companies operating in renewable energy area, this paper presents the possible renewable energy development-related employment in Indonesia. Agriculture, forestry, manufacturing, and construction are the possible sectors in which the number of green jobs creation is significant. In view of job creation per Megawatt energy capacity, it is confirmed that renewable energy development in Indonesia creates significant number of job opportunities.

The next paper, written by D. Sirat, A.D. Diponegoro, L.N. Hidayati, and F.H. Juwono, examines the signature recognition using Hidden Markov Model (HMM) where the signature image is transmitted from the remote station to the headquarter office by wireless. Frequently, the transmission of radio communication has been corrupted with Additive White Gaussian Noise (AWGN) over the Rayleigh fading channel. By reducing the number of bits in the bitstream, the signal prior to transmission was compressed by means of run-length encoding (RLE) or source coding. As a result, the authors argue that the successful rate of recognition was 0-36% without compression and 60-76% with compression.

The eighth paper, written by S. Widjanarko and B. Ubaydullaev, analyses the role of carbon capture and storage (CCS) in global energy portfolio. The authors argue that international collaboration, governmental incentives, positive investment climate, public awareness, and learning by doing experiments are needed in order to make the CCS technology successfully operated within a coal power plant. They further point out that the successful CCS technology application can also be achieved by enforcing policy on tax per ton of produced CO_2 and designing a new coal power generation plants combining an integrated gasification combined cycle and oxyfuel plants.

The ninth paper, written by A. S. Baskoro, R. Masuda, and Y. Suga, evaluates a comparison between particle swarm optimization and genetic algorithm for edge detection of molten pool in fixed aluminum pipe welding. The research was conducted for aluminium welding of aluminum alloy Al6063S-T6 with controlled welding speed and Charge-Coupled Device (CCD) camera as a vision sensor. As a result, an optimized brightness range for edge detection of molten pool using particle swarm compared to genetic algorithm is proposed. The result demonstrates the effectiveness of the image processing algorithm and control process.

The last paper, written by A.H. Abu Bakar, K.S. Cheen, and Rahmawaty, evaluates the sustainable housing practices in Malaysian housing development towards establishing sustainability index. The paper reviews various sustainable rating systems on sustainable housing that have been developed by various countries. Some important factors used to develop a tool for measuring sustainability practices including sustainability criteria that are related to environment, society, economics, site/land use, communication, and transportation.

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

With warmest regards from editorial desk,

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