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Elmer P. Dadios *Editor-in-Chief*

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From the Editor

The *Journal of Computational Innovations and Engineering Applications* (JCIEA) is a peer-reviewed and abstracted journal published twice a year by De La Salle University, Manila, Philippines. JCIEA aims to promote and facilitate the dissemination of quality research outputs that can push for the growth of the nation's research productivity. In its second volume first issue, six articles were selected to provide valuable references for researchers and practitioners in the field of environmental engineering, microalgal cultivation for food, pharmaceuticals, and fuel source, aeronautical engineering and design, swarm and computational intelligence, and self-adaptive systems for network performance optimization.

The first article is "A Survey on Management of Upstream Land Use and its Impact on Downstream Water Quality Parameters." This paper introduces the various upstream land use activities that are major contributors of downstream water pollution. The proposed measures to reduce the pollution of downstream water bodies such as sustainable agricultural activities, systematic land allocation and management are discussed in the paper. It presents the analysis of upstream land use against the water quality parameters measured at different water management facilities to identify the most significant land use factors for optimization.

The second article is "Foraging Behaviors – Pheromone, Task Allocation, and Trophallaxis - A Relative Comparison for Robotic Swarm Foraging." A group of algorithms enhancing such collective behavior is inspired by the animals working together as a group such as ants, bees, and etc. In connection, swarm is defined as a set of two or more independent homogenous or heterogeneous agents acting upon a common environment in a coherent fashion which generates emergent behavior. The development of artificial swarms or robotic swarms has attracted a lot of researchers in the last two decades including pheromone, trophallaxis and task allocation algorithms. However, among these swarm based algorithms, the most efficient in terms of group performance, efficiency and interference in collecting the dusts or objects in an environment with variable terrains. With this, the researchers see the need to develop a swarm simulation platform that would compare the swarm-behavior-based algorithms for an ideal use of robots in different environments in dust collection.

The third article is "*Lift Enhancement of the LRN 1015 Airfoil using a Gurney Flap: A Computational Fluid Dynamics Investigation.*" A Gurney flap is a small tab installed at the trailing edge of a wing to enhance the lift of an airfoil. The LRN 1015 airfoil has a high lift-to-drag ratio but is not considered to be a high-lift airfoil. If its lift is improved, additional benefits such as reduced take-off and landing roll, reduced stalling velocity, and increased payload capacity, among others, can be gained. In this light, the effects of the integration of the flap into the airfoil were investigated using a computational fluid dynamics approach. Part of this study is the

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validation of the computational fluid dynamics model used through investigation of the unflapped airfoil using ANSYS CFX with a Shear Stress Transport k- ω turbulence model, and comparison of the results with wind tunnel data.

The fourth article, "Development of a microalgal automated cultivation system on Tetradesmus obliquus," proposed an automated monitoring system for a closed microalgae photobioreactor. Microalgae have been a potential source of food, cosmetics, pharmaceutical, and fuel. However, monitoring the growth parameters of microalgae such as the pH level, salinity, dissolved oxygen, and its color density over time has not yet been achieved in previous studies. The set-up includes a vision system to monitor the changes in the color of the solution, corresponding to the population growth of the microalgae cells. Optical density readings are also done to characterize the growth of the microalgae organisms to serve as a benchmark for the experiment results. The system is employed and tested on Tetradesmus obliquus (Turpin) M.J.Wynne species, also known as [syn. Scenedesmus obliquus (Turpin) Kützing].

The fifth article, "Portable Water Purification System using Electrodialysis Reversal," discussed the development of a water purification system using electrodialysis reversal that can be carried in remote or rural areas and can be powered either by AC supply or solar energy. This system provides an easy way to treat brackish water by using electrodes and current to mitigate the impurities, including the bacteria present in the contaminated water. Three (3) microbiological tests are performed to determine the quality of water produced namely: fecal coliform, total coliform test and heterotrophic plate count test. Through a series of experiments with the support of an accredited Department of Health (DOH) water testing laboratory, it is proven that an hour of treatment is enough to produce five (5) gallons of potable water.

The sixth article is "Self-Adaptive WLAN Access Point for Optimizing Network Performance Using Multi-Objective Genetic Algorithm (MOGA)." The current deployment of WLAN access points (AP) require manual configuration of wireless parameters. Wireless parameters are commonly set haphazardly without being aware of the basic wireless conditions. This paper proposes a self-adaptive AP based on genetic algorithms (GA). The AP adapts to interference and link quality of client stations. Interference is mitigated and client link quality is improved or optimized. A chromosome consists of genes of parameters such as frequency channel, channel width, maximum data rate, maximum transmit power, and guard interval. Often competing objectives such as mitigating interference, maximizing the data rate, and minimizing the error rates necessitate that the GA be multi-objective. The MOGA comes up with the fittest candidates by running them through a fitness function which scores the genes based on the survey scan of other interferer AP and the wireless performance statistics of client devices. The GA's chosen configuration is applied and its effect is continuously assessed.

The JCIEA editorial board expresses their warmest thanks and deepest gratitude to the distinguished authors for their outstanding contribution to JCIEA second volume first issue. They likewise express profound appreciation to the peer reviewers for their assistance and cooperation.

Original research outputs are most welcome to JCIEA. There is no publication fee in this journal, and the research papers are assured of fair and fast peer review process. For further information, please visit www.dlsu.edu.ph/offices/publishinghouse/journals. asp. and www.jciea.com

> **Prof. Elmer P. Dadios, PhD** *Editor-in-Chief, JCIEA*