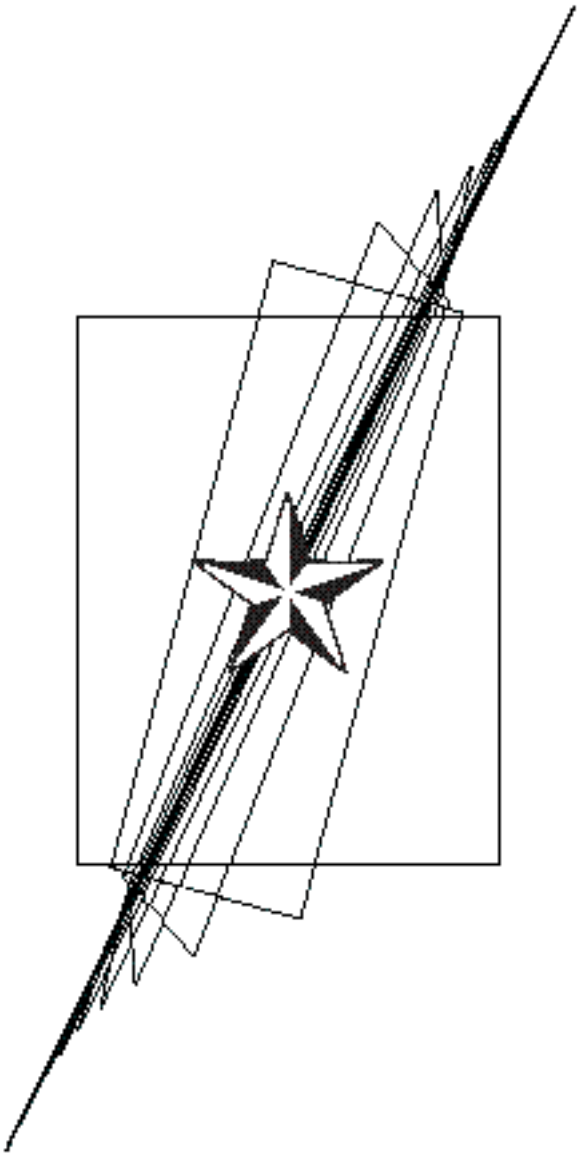

JOURNAL OF COMPUTATIONAL INNOVATIONS AND ENGINEERING APPLICATIONS

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The **Journal of Computational Innovations and Engineering Applications (JCIEA)** is a peer-reviewed, open access journal of De La Salle University, Manila. The JCIEA aims to promote the development of new and creative ideas on the use of technology in solving different problems in different fields of our daily lives. The JCIEA solicits high quality papers containing original contributions in all areas of theory and applications of Engineering and Computing including but not limited to: Computational Applications, Computational Intelligence, Electronics and Information and Communications Technology (ICT), Manufacturing Engineering, Energy and Environment, Robotics, Control and Automation, and all their related fields. The JCIEA editorial board is comprised of experts from around the world who are proactively pushing for the development of research in these fields.

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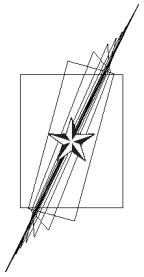

JOURNAL OF COMPUTATIONAL INNOVATIONS AND ENGINEERING APPLICATIONS

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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, second issue, seven articles were selected to provide valuable references for researchers and practitioners in the field of environmental engineering, air quality monitoring, agricultural crop health assessment, healthcare engineering, assistive systems, machine learning, computer vision, video processing, wireless systems, motor controller for electric vehicles, and robotic systems.

The first article is "*Development and Implementation of an Adaptive LED Lighting System for Controlled Environment Agriculture*". In this paper, an improvement of the previous studies about the development and implementation of a lighting system. It utilizes solid-state lighting based on the use of light-emitting diodes (LEDs) integrated with an intelligent algorithm to be adaptive to the light requirements of specific plants. A lighting profile was created which is based on previous studies about the response of tomato plants to different light characteristics. This includes the light quality or spectral distribution of light, light quantity or irradiance levels, and light duration or photoperiod for every growth stage that significantly improve over-all plant development.

The second article is "*Development of an Automated Cows In-Heat Detection and Monitoring System Using Image Recognition with GSM Based Notification System*". Farm owners need to know the precise time of mating of the cows as this will improve the breeding process. Each cow has been tagged for easy monitoring of which of them is in-heat. In this study, an estrus detection using image recognition is used to detect the standing heat. The system is comprised of detection, identification, and notification system. Scale Invariant Feature Transform (SIFT) is responsible for the detection and identification of in-heat cows. Using SIFT, the images of cows were registered in the database, these images were used for detection and identification of cows and an algorithm for feature overlapping were created to detect the standing heat.

The third article is "*Fuzzy Logic-Based Load-Frequency Controller Using Arduino for Hybrid Off-Grid Pico-Hydropower Systems*". This paper aims to develop a load- frequency controller was designed based on fuzzy logic algorithm to regulate and maintain the load-frequency generated by this power system to 60 Hz with +/- 10% tolerance. The purpose of the low frequency controller is to regulate stable system frequency which does not have steady state errors and to deliver load sharing with multi areas interconnected in the power system using different algorithms. Off-grid hydropower generation needs parameter regulations to ensure safety and standards of power production. When the detected load-frequency is within its limits, the controller allows the servo motor to remain in its current position to maintain its produced power. The study proved that maintaining the required frequency of 60 Hz within 10% tolerance is necessary.

The fourth article is "*Speech Assistive Device For Students With Autism Spectrum Disorder: A Review*". This paper discusses the relevant technologies for speech assistive needed by an individual who has an autism spectrum disorder. Autism Spectrum Disorder (ASD) is one of the many conditions that can be observed present in the students under Special Education. It is a developmental incapacity that causes difficulty in communication and socialization, with unique behavioral challenges. Some has severe speech impairment and some has the ability to speak. For this reason, technologies such as speech assistive devices are developed to assist the needs to develop communication skills. The Tablet SGD provides the best assistive device compared to other existing devices.

The fifth article is "*Multi-Class Vehicle and Pedestrian Classification Using Convolutional Neural Network for Traffic Flow and Congestion Composition Analysis*". A CNN model was developed to classify both vehicles and pedestrians for the analysis of traffic flow and congestion. It focused on analyzing the traffic flow and volume at different time intervals in a microscopic scale traffic network by decomposing it into eight separate classes of vehicles and pedestrians. The results also showed how each component (class) contributes to the overall road traffic.

The sixth article is "*Automated Nutrient Solution Control System using Embedded Fuzzy Logic Controller for Smart Nutrient Film Technique Aquaponics*". This paper addresses the problem of nutrient imbalance occurring in aquaponic system. The proposed study is the development of an automated biological information control system using fuzzy logic for smart aquaponics. This system is composed of two sections: the design of nutrient solution control system and the design of fuzzy logic that will control the solenoid valves for fluid distribution based on the levels of pH and electrical conductivity. The embedded fuzzy logic library (eFLL) was deployed using Arduino microcontroller. The designed mechanism provides suitable decisions for the control system of aquaponics nutrient solution.

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.

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