Editorial

I. Notes from the Editors

'Resilience' is the ability to recover from setbacks, adapt well to change, and keep going in the face of adversity. The Fifth Industrial Engineering and Management Conference 2022 (IEM5-2022) will be hosted by the Faculty of Engineering of The University of the West Indies (UWI), St Augustine, Trinidad and Tobago on 4th-5th November, 2022, in collaboration with APETT and other professional bodies. Following the past four IEM Conferences held in 2006, 2010, 2014, and 2018, the theme of the 2022 Conference is "Emerging Research and Practices in Engineering Resilience and Management".

The IEM5-2022 conference provides a platform for researchers and practitioners from different disciplines to share impactful and use-inspired research on a range of topics including the lessons learned from the pandemic and ideas shaping the post-pandemic world. This issue also include a call for abstracts and papers for the conference. Extended abstracts and full papers in English should be sent via e-mail <KitFai.Pun@sta.uwi.edu>. .

II. About this Issue

In this Volume 45 Number 1, the Journal includes ten (10) research/ technical articles. The relevance and usefulness of respective articles are summarised below.

S. Harrison, *et al.*, "Optimisation of Maintenance Operations Involving Three Integrated Departments at a Local Oil Company in Trinidad", assessed the utility of predictive maintenance and database management for lean maintenance applications within a Petroleum Company. A simulation case study was conducted to explore a proposed lean strategy on the operations of three departments related to the maintenance of pumping equipment in the company. These departments were, the Pump Shop, Stores Department, and Shipping and Receiving. Rockwell Automation's Arena® simulation software was used to study existing and proposed models of the maintenance system and track the key performance indicators of flow time, waiting time and work-in-process. Analysis of the performance indicators showed a 76% and a 96% reduction in average flow time and waiting time, respectively. No difference was determined for work-in-process at the 95% confidence interval.

In their article, "Mitigation of Design Issues in Development of Anatomical Models Using Rapid Prototyping", **N. George** and **B.V. Chowdary,** explored the use of a genetic algorithm (GA) approach combined with computer-aided design (CAD) and fused deposition modeling (FDM) techniques. Experiments were conducted using response surface methodology (RSM) to facilitate the optimisation process with build time and model material volume as responses. The validation has been performed with a patella model, and the results verified the effectiveness of the proposed RSM-GA approach in design and development of the anatomical model. The results showed a 27% savings on model material compared to a non-refined model and was deemed satisfactory for practical use by reducing irregularities from CT data. This also revealed that the parameter hollow has the largest effect on the responses.

O'Neil Falloon *et al.*, "Characterisation, Antioxidant Activity and Chain Breaking Properties of *Blighia sapida* Oil Extracts", characterised the lipid extracts of the arilli and seeds of the fully mature fruit. The acid, iodine, peroxide, and saponification values of the lipid extracts as well as the refractive index, were determined. Their antioxidant and chain breaking properties were also evaluated. Ackee oil exhibited several characteristic features of oils that are currently utilised commercially. Ackee oil extracts could be considered for utilisation in commercial applications in the food and cosmetic industries.

N. Ramsawak and **B.V. Chowdary,** "Integration of Computer Aided Design and Engineering (CAD/E) Principles for Development of a Face Shield Concept to Protect against the COVID-19 Virus", investigated the CAD/E principles for the development of a face shield concept. The study was orchestrated through the use of the SolidWorks software in generating CAD concepts, employment of the SolidWorks Sustainability tool to evaluate the most viable concept's lifecycle environmental effects, and the subsequent material redesign of this concept within the sustainability tool to reduce its adverse inflictions on nature. This paper described the development of the CAD/E concept through the major avenues of sustainability and environmental conservation, and explored a niche in this expanding field.

In the fifth article, "Measurement of Swash Infiltration Rates on Sandy Beaches", **S. Brathwaite** and **D. Villarroel-Lamb** proposed a simple technique to determine the rate of swash infiltration on sandy beaches of Las Cuevas Bay located on the north coast of Trinidad. The method incorporated the use of a double ring infiltrometer paired with a Bluetooth water level logger, where infiltration rates were inferred from the changes in water level recorded within the double ring infiltrometer. The study attempted to ascertain the correlation between the measured infiltration rates and sediment properties. The use of the maximum recorded infiltration rate yielded the best correlation across most cases observed. The results demonstrate a need to capture additional bed features that contribute to the rate of infiltration.

J. Hayles, K.S. Alli, and **LA. Haninph,** "A Convolutional Neural Network Based Robust Automated Real-Time Image Detection System for Personal Protective Equipment", presented the design and implementation of a functional image detection system. A convolutional neural network (CNN) was used to develop

three sets (namely, hard hats, boots, and vest) of models. These models were used to detect the appearance of workers and determine if personal protection equipment (PPE) being worn was in compliance with the stipulated requirements for entry to a particularly hazardous workplace. The performance of respective model was validated with two classes of image dataset: normal colour RGB (Red, Green and Blue) and grayscale image dataset. The overall average accuracy of the system was calculated as 83.33% in real-time implementation. This system could help to provide level of accident prevention.

A.A. Akinola and **E.T. Abeokuta,** "Rehydration Characteristics of Beetroot, Sweet Potato and Yam Slices Dried using the Refractance Window™ Method", assessed the suitability of four studied models for measuring the rehydration ratio and moisture content during the hydration process of sample slices. These models are composed of the Akinola et al., the Exponential, the Peleg, and the Weibull models. Rehydration occurred at 27◦C, and the mass/moisture content history data was recorded for the samples. The study results show a rapid increase in rehydration in the initial hour of the rehydration process. This increase gradually decreases to a contact equilibrium value. For the yam, sweet potato, and beetroot slices, the rehydration ratio values approached 2.1, 2.1 and 6.5, respectively. It is claimed that knowledge of the rehydration characteristics of the agro-products will be valuable in the design, operation and optimisation of processing equipment and prediction of water absorption with time.

The views expressed in articles are those of the authors to whom they are credited. This does not necessarily reflect the opinions or policy of the Journal.

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July 2022