I. Notes from the Editor

The APETT Journal aims to provide a broad coverage of subjects relating to engineering. Preference will be given to papers describing original engineering work, or material of specific interest to engineers and those working in related fields, in Trinidad and Tobago and the Caribbean region.

This issue also includes an announcement and a Call for Papers for the Fourth Industrial Engineering and Management Conference 2018 (IEM4-2018) that is to be hosted at the Faculty of Engineering, The University of the West Indies on 7th-8th December 2018. With the theme on “Striving for business/engineering performance excellence with quality management and IEM practices”, the Conference IEM4-2018 invites papers for presentation, and suggested topics of interests fall into two groups of 1) Traditional Industrial Engineering areas and 2) with Quality Management focus. For Enquiries and Registration, contact Professor Kit Fai Pun or Dr. Cilla T. Benjamin, c/o Faculty of Engineering, UWI, St Augustine Campus, Trinidad and Tobago, e-mails: KitFai.Pun@sta.uwi.edu; Cilla.Benjamin@sta.uwi.edu

II. About This Issue

This Issue (Volume 46 Number 1) of the Journal includes six (6) articles and a memorial written for the late Emeritus Professor Harry Phelps who was the past President of APETT, 1975-1976. The relevance and usefulness of these articles are summarised below.

O.O.E. Ajibola et al., “Development of Sport Utility Vest that Captures Cardiographic Data and Its Relationship to Arterial Pressure in Real Time”, present the development of a sport utility vest that utilises closed circuit system. The system would monitor the cardiovascular activities of an athlete with the capability to report same to a third party device in real time. A continuous monitoring of physiological signals from the heart is the most efficient way of tracking the heart status of athletes who are prone to cardiovascular diseases without prior symptoms. In this paper, the authors demonstrate the possibility of remote acquisition, display, and storage of the heart rate of an athlete in real time using an electrocardiogram system designed on a sport wear. The entire system is comprised of three Lead electrodes, arranged at strategic parts of the sport vest; the electronic circuit which amplifies the data signals and filters to enhance minimum noise to signal ratio; and the transceiver which sends and receives signal through a wireless Radio Frequency linked to a third-party device such as Personal Computer. This system also presents a warning alarm in case the heartbeat goes beyond the preset threshold, which allows a great opportunity for rapid intervention by a physician.

Based on their work, “Development, Evaluation and Soot Formation Characteristics of a Low-cost Pressurised Kerosene Stove”, F.O. Anafi, et al. investigate into the combustion of kerosene fuel in poorly designed cook stoves as a major domestic source of poor indoor air quality in the developing world. They present the design of the pressurised kerosene stove focused on the provision of sizable and adjustable air inlet to ensure availability of sufficient air for complete combustion of the kerosene fuel as well as regulating the flame. Performance test results showed that the pressurised kerosene stove generated more heat and also produced less carbon soot than the conventional kerosene stove (wick stove). The thermal efficiency of the pressurised kerosene stove is higher when compared with the thermal efficiency of the baseline kerosene wick stove. The fuel burns with a blue flame and less smoke with very little soot at the pot base. This was affirmed by the emission test carried out.

A.A. Akinola et al., “Kinetics of the Dehydration of Cucumber Slices with a Refractance Window™ Dryer”, investigate into the variation of the rehydration ratio of the cucumber slices with rehydration time using the dryer. It was found that the cucumber slices dried to a moisture content of less than 10% (dry basis) in about 120 minutes. The regression analysis results showed that the Haghi and Ghanadzadeh thin-layer drying model best describes the drying behaviour of the 3 mm thick slices with a coefficient of determination (R²) value of 0.9994. The rehydration ratio of the cucumber samples varied from 3.47 to 5.25 with rehydration times of 10 to 300 minutes respectively. The effective moisture diffusivity of the 3 mm thick cucumber slices was determined. The implications of the work are that the Refractance Window™ (RW) drying technique will dry cucumber slices at a faster rate than the traditional methods and the drying data obtained can be used in the design of an industrial scale RW dryer.

In their paper, “Temperature Dependence of the Effective Moisture Diffusivity of Yam (Dioscorea rotundata) Slices Dried Using a Refractance Window™ Dryer”, A.A. Akinolaa et al., further present the dependence of the effective moisture diffusivity of yam slices on temperature using the dryer. The experimental drying data obtained was used to estimate the moisture diffusivities, and the activation energy for the process conditions considered. The effective moisture diffusivities was estimated using Fick’s second law for 4.5 mm thick yam slices for the temperatures studied. The activation energy was estimated using the Arrhenius type equation for the given temperature range. Results show that the effective moisture diffusivities values are slightly higher than those reported in the literature because the investigations were performed at higher temperatures than...
those found in the literature. Higher moisture diffusivities imply that there is higher moisture movement through the interstices of the slices, which in turn indicates a higher rate of drying.

E.I. Ekwue et al., “A Wet Sieving Apparatus for Determining Aggregate Stability of Soils”, describe the design, construction and testing of an apparatus that is used to wet sieve soil aggregates and determine their stability to water disruption. Seven soils were used to test this equipment, each at three frequencies of sieving. Aggregate stability measured with this equipment was expressed using percentage water stable aggregates (WSA) and mean weight diameter (MWD). The major advantage of the constructed soil wet sieving apparatus is that two stacks of sieves are incorporated into the design, cutting by almost half, the normal time required for wet sieving using the original design of the equipment which utilised a single sieve stack. The frequency of oscillation of the sieves did not significantly affect the aggregate stability of most of the soils, apart from the sandy loam and one clay soil, where the effect was minimal.

D. Maharaj and K.F. Pun, “Managing Supply Chain Risk in a Petrochemical Firm in Trinidad and Tobago: A Case Study”, explore the risk associated with managing the supply chain in the petrochemical firms in Trinidad and Tobago (T&T). Empirical data was acquired and analysed via interviews and surveys conducted in a case company. It was found that one susceptible challenge was operations vulnerability associated with late delivery of material and poor contractor performance. Incorporated the desk research with empirical findings, a structured SCRM (Supply Chain Risk Management) approach comprising of a host of principle, philosophical and procedural elements, was initiated. An implementation agenda was developed along with record of the SCRM adoption at the company. The findings would contribute towards the field of SCRM applications and provide some insights for synthesising emergent issues for future research.

G.S. Shrivastava and C.A.C. Imbert, “Professor Emeritus Harry Orville Phelps (1929-2018): A Memorial”, speak about both academic and profession life, and recognise the commitments and contributions of late Professor Emeritus Harry Orville Phelps towards the development of civil engineering disciplines and professional in Trinidad and Tobago and the wider Caribbean region. Professor Emeritus Phelps, being the past President of the APETT (1975-1976) and Head of Department of Civil Engineering (1972-1984) of The University of the West Indies, will live in the memory of his students and colleagues.

III. Acknowledgements

On behalf of the Association, we gratefully acknowledge all authors who have made this issue possible with their research work. We greatly appreciate the voluntary contributions and unfailing support that our reviewers give to the Journal. Our reviewer panel is composed of academia, scientists, and practising engineers and professionals from industry as listed below:

- Dr. Albert H.C. Tsang; The Polytechnic University of Hong Kong
- Dr. Chris Maharaj; University of the West Indies (UWI), Trinidad and Tobago (T&T)
- Professor Edwin I. Ekwue; UWI, T&T
- Professor Kit Fai Pun; UWI, T&T
- Ms. Man Yin R. Yiu; UWI, T&T
- Dr. Musti Sastry; UWI, T&T
- Dr. Reynold Stone; UWI, T&T
- Mr. Robert Birch; UWI, T&T
- Dr. Saheeda Mujaffar; UWI, T&T
- Professor Sreekala G. Bajwa; North Dakota State University, Fargo, USA
- Dr. Umesh Persad; University of Trinidad and Tobago (UTT), T&T
- Mr. Vladimir Guillen; UTT, T&T

Finally, the views expressed in articles are those of the authors. This does not necessarily reflect the opinions or policy of the Association.

KIT FAI PUN, Editor
Faculty of Engineering,
The University of the West Indies,
St Augustine, Trinidad and Tobago
West Indies

April 2018