

# Foreword

Welcome to the fifth issue of 2024 for the *Pertanika Journal of Science and Technology (PJST)*!

PJST is an open-access journal for studies in Science and Technology published by Universiti Putra Malaysia Press. It is independently owned and managed by the university for the benefit of the world-wide science community.

This issue contains 25 articles; four review articles and the rest are regular articles. The authors of these articles come from different countries namely Australia, Bangladesh, Canada, France, India, Indonesia, Iraq, Malaysia, Nigeria, Pakistan, Russia and Sultanate of Oman.

In their article “Microwave electro-technological installation for processing vegetable-origin organic materials and agricultural crops,” Midhat Tukhvatullin and Eduard Khasanov from Bashkir State Agrarian University, Russia, present a unique study. They have identified the optimal process conditions, involving the operation of 7 magnetrons and a rotation mechanism for vegetable-origin organic materials. The processing time is less than 15 hours, and the final humidity does not exceed 7% with uniform temperature change. The temperature at a depth of 1/4 of the thickness of the samples differs from the temperature on the surface of the samples by 0.5–1.0°C. The differences in the calculated and experimental data on the humidity of organic materials of plant origin do not exceed 3.8%. This innovative approach of creating a microwave installation for the simultaneous microwave processing of vegetable organic materials and agricultural crops will significantly increase the energy and economic efficiency of the installation by reducing the processing time and increasing the quality of dried material quality. The detailed information of this study is available on page 2213.

The next article discussed the smoothing Rapidly Exploring Random Tree (RRT) path for mobile robot navigation using the bio-inspired optimization method. The main objective is to improve the smoothness of RRT-generated trajectories and reduce significant path curvature. A novel approach is proposed, integrating the RRT path planner with a modified version of the Whale Optimization Algorithm (RRT-WOA). The modified WOA algorithm incorporates parameter variation ( $\vec{C}$ ) specifically designed to optimize trajectory smoothness. Additionally, Piecewise Cubic Hermite Interpolating Polynomial instead of conventional splines for point interpolation further smoothes the generated paths. The modified WOA algorithm is thoroughly evaluated through a comprehensive comparative analysis, outperforming other popular population-based optimization algorithms such as Particle Swarm Optimization, Artificial Bee Colony, and Firefly Algorithm in terms of optimization time, trajectory smoothness, and improvement from the initial guess. The resultant optimized path is also validated using hardware to ensure path validity. This research contributes a refined trajectory planning approach and highlights the competitive advantage of the modified WOA algorithm in achieving smoother and more efficient trajectories compared to existing methods. Details of this study are available on page 2327.

An investigation on early triage prediction for outpatient care based on heterogeneous medical data utilizing machine learning (ML) was conducted by Omar Sadeq Salman et al. from Universiti Teknologi Malaysia and AL Iraqia University, Iraq. A comparative study was conducted to ascertain how well different supervised ML models evaluated patient triage outcomes for outpatient care. Hence, data from diverse, rapidly generated sources is crucial for informed patient triage decisions. Collected through The Internet of Medical Things (IoMT) enabled sensors, it includes sensory data (electrocardiogram, blood pressure, oxygen saturation, temperature) and non-sensory text frame measurements. The study examined six supervised ML algorithms. These models were trained using patient medical data and validated by assessing their performance. Supervised ML technology was implemented in Hadoop and Spark environments to identify individuals with chronic illnesses accurately. A dataset of 55,680 patient records was used to evaluate methods and determine the best match for disease prediction. The simulation results highlight the powerful integration of ML in telemedicine to analyze data from heterogeneous IoMT devices, indicating that the Decision Tree algorithm outperformed the other five ML algorithms by 93.50% in terms of performance and accuracy metrics. This result provides practical insights for developing automated triage models in telemedicine systems. Further details of the investigation can be found on page 2343.

We anticipate that you will find the evidence presented in this issue to be intriguing, thought-provoking and useful in reaching new milestones in your own research. Please recommend the journal to your colleagues and students to make this endeavour meaningful.

All the papers published in this edition underwent Pertanika's stringent peer-review process involving a minimum of two reviewers comprising internal as well as external referees. This was to ensure that the quality of the papers justified the high ranking of the journal, which is renowned as a heavily-cited journal not only by authors and researchers in Malaysia but by those in other countries around the world as well.

We would also like to express our gratitude to all the contributors, namely the authors, reviewers, Editor-in-Chief and Editorial Board Members of PJST, who have made this issue possible.

PJST is currently accepting manuscripts for upcoming issues based on original qualitative or quantitative research that opens new areas of inquiry and investigation.

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