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Editorial

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Machine learning and digital engineering in Southeast Asia

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EDITORIAL

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Science, Engineering, and Health Studies (SEHS) collaborated with the Asia Joint Conference on Computing (AJCC) for the second year in a row to provide a platform for authors to publish their research works on information and computer technology that play critical roles in several industrial sectors (Sriamornsak and Waijanya, 2021). Artificial intelligence is critical to Southeast Asia's future, but it is still in its infancy. As a result, the theme for AJCC 2022 was machine learning and digital engineering in recent world.

Machine learning technology is becoming more prevalent in applications that use everything from sensor data to consumer information repositories, increasing the need for hardware and software engineers to become familiar with it. The learning curve may be higher for some designers because this kind of control algorithm is fundamentally different from those based on conventional logic. However, it is now necessary for all engineers to comprehend how this technology alters the design process and what methods and procedures facilitate its application.

Convolutional neural networks (CNNs) are now the most advanced method for image recognition, including vehicle image classification. Using the combined power of multiple CNNs improves final output accuracy, but it is time-consuming. Boonsirisumpun and Surinta (2022) introduced a new method called "ensemble multiple CNNs methods with partial training set", which combines the advantages of the ensemble to increase accuracy and the concept of partial training set to reduce training time, making it a good choice to compete with other single CNNs models.

Iamsa-at et al. (2022) have used a modified artificial emotional neural network (AENN) based on an enhanced JAYA optimizer to present the problem of predicting domestic power peak demand for long-term electricity construction planning. Additionally, they used an extreme learning machine to compute the AENN's expanded feature. In order to compare the effectiveness of a developed predicting model to AENN models, artificial neural networks with Levenberg-Marquardt, AENN methods based on winner-take-all approach, and improved brain emotional learning-based AENN model, a real case study of Thailand's peak demand for electricity was taken into consideration and prepared using a rolling mechanism.

Performance evaluations showed that the proposed model outperformed the comparative models and had greater generalized stability.

Many examples of large open-source software have been developed today to promote free information distribution. Unfortunately, no software is free of errors and defects, which are referred to as bugs. When software defects (or bugs) are discovered, they must be addressed immediately in order for the software to function properly. The classification task for bug reports includes not only binary classification but also multiclassification. Polpinij et al. (2022) divided bug reports into three categories: real-bug, enhancement, and task. They started the classification with bug report pre-processing, developed multi-classifier models based on the vector of bug reports, and then compared with eight machine learning algorithms. The classifier model created by support vector machine (SVM) with radial basis function was chosen to be compared to the baseline approach after the multi-classifier models were assessed and found to produce the best results. The model produced by the suggested method was just slightly better than the standard procedure.

Data governance is defined as general data management practices and redundant data structures, as well as the establishment of policies and controls to ensure policy compliance with rules and regulations. The agile concept entrusts a non-invasive co-design and decision-making team to support the operations of the organization while focusing on people and interactions. Innun et al. (2022) employed the medical agile non-invasive data governance (MANI-DG) methodology, which aims to formally assign roles and responsibilities to groups. The implementation and evaluation processes were divided into two levels: organizational and operational. The researchers discovered that MANI-DG prototype design is complete, with coverage of both roles and responsibilities at each level according to the organizational structure, after comparing the results to those of existing frameworks or studies. It has the potential to improve work processes and lead to analytics that link to valuable, accurate, and transparent targeted outcomes for organizations.

Sangkaphet et al. (2022) created a system to detect foot strike patterns while running using an inexpensive wireless wearable sensor system that focused on feature generation with hybrid center of pressure and principal component analysis, as well as pattern classification with machine learning. To determine the best classifier, different classifiers were compared, including SVM with linear kernel function, SVM with polynomial kernel function, SVM with radial basis function, k-nearest neighbor, artificial neural network, and random forest. The proposed feature generation method could improve machine learning performance for foot strike pattern classification, and the best classifier was SVM with radial basis function. This recognition system was thus established and was capable of detecting foot strike patterns.

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