

Editor's Column

Mladen Knezic

When things go well it's easy to be good, in adversity one learns who is the hero.

Petar II Petrović Njegoš

Editorial Letter

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IN December issue we conclude 2024 year with four papers that show new advancements in application of deep learning technology in medical and energy sector, as well as for analog circuits fault diagnosis. Last paper brings some insights in optimal PI controller design for a two-tank system.

In the first paper, "A Privacy-Preserving Secure Data Processing Scheme for the Internet of Medical Things," authors Y. Huang and Y. Su, proposed a secure data processing scheme, called Persuaded Data Processing with Digital Security (PDP-DS), for leveraging the Internet of Medical Things (IoMT) application performance. The proposed scheme exploits the deep learning paradigm for classifying authenticated and failed processing and sharing sequences. The results obtained using MATLAB tool indicated reduction of process delay by 11.14%, replication by 12%, false rate by 9.89%, and backlogs by 7.88% for different attributes compared to other methods.

The second paper, entitled "Deceptive Maneuvers: Subverting CNN-AdaBoost Model for Energy Theft Detection," authored by S. Nirmal and P. Patil, presents a generative method for creating evasion attacks against a hybrid model that combines Convolutional Neural Network and Adaboost (CNN-Adaboost), aiming at making an energy theft detection system more robust. The proposed attack is validated using State Grid Corporation of China (SGCC) dataset, and the reported results show that increase of adversarial accuracy by up to 97% and decrease of the attack success rate (ASR) by up to 3%.

The paper entitled "Analog Circuits Fault Diagnosis Using ISM Technique and a GA-SVM Classifier Approach," authors S. Kouachi, N. Bourouba, K. Mebarkia, and I. Laidani have presented a work that aims at contributing to the solution of

the problems encountered in electronic circuits fault diagnosis for two filtering analog circuit examples: Sallen-Key band-pass filter and Four Opamp Biquad high-pass filter. The proposed technique is based on the use of estimated system identification (SI) output error (OE) model for feature extraction purpose and combination of two methods: Genetic Algorithm (GA) and Support Vector Machine (SVM). responses. As a result, the OE model has achieved 100% fault coverage and its construction reached high accuracy level exceeding 98% for faulty circuits. This accuracy level ambition us to use its coefficients as input features for our Hybrid proposal fault classifier. This is built with GA and SVM algorithms combination targeting both data reduction and fault classification accuracy respectively. The results achieved are conclusive since the classifier accuracy level reached 100% and a 70% of feature data volume reduction was scored.

The final paper, "Locally Optimal PI Controller for a Two-Tank System," by I. Krčmar, V. Đalić, A. Rakić, and P. Marić, provides an extensive experimental analysis of an optimal PI controller for the two-tank system. The two-tank system is a benchmark hydrodynamic system. The PI controller has proportional action placed in a feedback path of the system, thus supporting aperiodic response of the system. The results of the experiments verify the design procedure of the PI controller. The designed PI controller provides noticeable slow start of the system, thus forcing an actuator to operate on a border line of the dead zone for a significant period. To remedy the situation, a feed-forward modification of the controller is proposed. Performed experiments have verified designed performance of the optimal PI controller, as it has provided aperiodic step response, approximately three times faster than response obtained in the open loop experiments.

As always, I thank the authors for their contribution to this issue of the journal and send great appreciation to all the reviewers who participated in the editorial process by providing valuable comments in timely manner to the editors and authors.