

## Editorial

Mirjana Ivanović, Miloš Radovanović, and Vladimir Kurbalija

University of Novi Sad, Faculty of Sciences  
Novi Sad, Serbia  
{mira,radacha,kurba}@dmi.uns.ac.rs

The fourth and final issue of Volume 21 of Computer Science and Information Systems is comprised of 9 regular articles and three special sections: “Explainable and trustworthy methods for next-generation artificial intelligence for Reasonable Data Size” (7 articles), “Recent Advances in AI Methods for Image Processing: Theory, Algorithms, and Applications” (14 papers) and “Selected papers from the European Conference on Advances in Databases and Information Systems” (3 articles).

The first regular article, “Threshold Segmentation Based on Information Fusion for Object Shadow Detection in Remote Sensing Images” by Shoulin Yin et al., propose a novel threshold segmentation method where object shadow pixels are first screened using intensity and chromaticity information in HSI color space. Then, principal component analysis (PCA) is applied to the remote sensing image to obtain the first principal component, after which a new shadow index is constructed by fusing the results obtained from HSI and the first principal component. Finally, a threshold segmentation model is established using an improved threshold segmentation algorithm.

In the second regular article, “Tourist Services Management through Clients Scoring Using a Bio-Inspired Agent Architecture,” Raúl Moreno et al. present a complete framework, Pharaoh, which can make recommendations to customers covering the final user perspective and provide support to travel agents, by filtering the best travel, accommodation, and activity options according to the desires of the customers. This is achieved through effective use of a bio-inspired multi-agent system (MAS).

“PTB-FLA Development Paradigm Adaptation for ChatGPT,” by Miroslav Popovic et al. adapts the original four-stage Python testbed for federated learning algorithms (PTB-FLA) paradigm into two new paradigms for ChatGPT, denoted the adapted four-phases paradigm and the adapted two-phases paradigm. The four-phase paradigm consists of producing the sequential code, the federated code, the federated code with callbacks, and the PTB-FLA code, respectively, while the two-phase paradigm produces the sequential and the PTB-FLA code.

Yuhao Dai and Fei Zhu, in “TRL-PROTAC: A Pre-Trained Generator of PROTACs Targeting Specific Proteins Optimized by Reinforcement Learning,” propose an integrated protocol for design and evaluation of proteolysis-targeting chimeras (PROTACs) targeting specific proteins, called TRL-PROTAC. TRL-PROTAC is focused on the de novo design of complete PROTACs by effectively joining the designed ligands targeting the proteins of interest (POI) with linkers.

The article “Psychological Effect Computation of Courtroom Arguments: A Deep Learning Approach of EEG Signal Data,” authored by Xuan Zhou et al., explores a neural reaction observation method for psychological effect analysis of attorney’s speeches in courtroom scenarios. A corpus of courtroom arguments from legal movies and television series were used as source material, and participants’ psychological responses to

the speeches were monitored with wearable electroencephalography (EEG) devices. Deep learning approaches based on convolutional neural networks (CNN) and long short-term memory (LSTM) networks were then employed to model attention intensity, cognitive load, and emotional changes.

In their article entitled “A Method for Solving Reconfiguration Blueprints Based on Multi-Agent Reinforcement Learning,” Jing Cheng et al. propose an improved value-decomposition network (VDN) method based on average sequential cumulative reward. By refining the characteristics of the integrated modular avionics system, mathematical models are developed for both the system and the reconfiguration blueprint. The improved VDN algorithm demonstrates superior convergence characteristics and optimization effects compared to traditional reinforcement learning algorithms such as Q-learning, deep Q-learning network (DQN), and VDN.

“Biometric Lock with Facial Recognition Implemented with Deep Learning Techniques,” by José Misael Burrueo-Zazueta et al. develops a biometric lock system (BLS) whose opening is performed by recognizing a person’s face, which solves the challenges of re-training, antispooofing, real-time response, and executes inside an embedded system. The proposed BLS overcomes these challenges using a pre-trained FaceNet network for feature extraction and coding, and incorporating ResNet18 + remote photoplethysmography (rPPG) to avoid spoofing.

Shi Shuxin et al., in their article “BLSAE-SNIDS: A Bi-LSTM Sparse Autoencoder Framework for Satellite Network Intrusion Detection,” present a satellite network intrusion detection system named Bi-LSTM sparse self encoder (BLSAE-SNIDS) to address various challenges in intrusion detection for satellite networks. Through the development of an innovative unsupervised training Bi-LSTM stacked self-encoder, BLSAE-SNIDS facilitates feature extraction from satellite network traffic, diminishes dimensionality, considerably reduces training and testing durations, and enhances attack prediction accuracy of the classifier.

Finally, “Sentiment Polarity Analysis of Love Letters: Evaluation of TextBlob, Vader, Flair, and Hugging Face Transformer,” by Gaganpreet Kaur et al. investigates the performance and accuracy of four popular Python libraries for sentiment analysis (TextBlob, Vader, Flair, and Hugging Face Transformer) in determining the polarity and intensity of sentiments in love letters. A corpus of 300 love letters was collected and randomly sampled to provide 500 sentences for analysis, with human experts evaluating the quality and accuracy of the sentiment annotations.

In the name of our editorial team, we extend our sincerest gratitude to everybody who contributed to the publication of ComSIS, including (but not limited to) our authors, reviewers, guest editors, colleagues, team members, and boards.