Guest Editorial: Advances on Information Communication Technologies and Intelligent Systems and their Applications

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Advances and research achievements in all domains of Computer Science and Information Communication Technologies, especially intelligent techniques and approaches, contribute significantly to quality of everyday life and functioning of society. Two interesting conferences were held in 2024, which provided a forum for researchers to disseminate wide range of their research achievements and scientific results. These two Conference are: the 10th Balkan Conference in Informatics (BCI), and the 18th International Conference on Innovations in Intelligent Systems and Applications (INISTA), both were held during 4-6 of September 2024 in Craiova, Romania.

The focus of the BCI series is to provide a forum for discussions and dissemination of research accomplishments in Computer Science and Information Technology and to promote interaction and collaboration among scientists from the Balkan countries and the rest of the world, and to encourage involvement of young researchers from the region. The BCI'2024 program included 23 full papers that were carefully reviewed and selected from 31 submissions. They covered numerous interesting topics: Data Mining and Machine Learning; Software and Systems; Languages and Text; Learning Issues; Distributed Systems; Medical and Health Issues; Web Issues and Tools; Security and Privacy.

INISTA conference aims to bring together the researchers from the entire spectrum of the multi-disciplinary fields of intelligent systems and to establish effective means of communication between them. In particular, it focuses on wide range of aspects of intelligent systems and related applications, from the points of view of both theory and practice. The INISTA'2024 program included 51 full papers carefully reviewed and selected from 74 submissions. The papers were grouped into the following areas of research and applications: Evolutionary Computing and Optimization; Artificial Intelligence in Cloud Computing; Intelligent Web and Microservices; Natural Language Processing; Biomedical Engineering and Healthcare; Smart Education and ELearning; Multi-Agent Systems; Intelligent Services for Transportation, Energy, Water and Food; IoT, Digital Twins, Robotics; Intelligence in Security, Risk, Fraud and Anomaly Detection; Computer Vision and Big Data.

This special section contains revised and extended versions of papers presented at the BCI'2024 and INISTA'2024 events. We have selected 11 papers from both events and invited authors to submit extended version to be considered for publishing in ComSIS Journal. Finally, after rigorous reviewing procedure 7 papers have been accepted for publication.

The first paper entitled "Using Genetic Programming as a Feature Selector and Classifier Implement Bankruptcy Prediction Models" by Ángel Beade, José Santos, Manuel Rodríguez, contributes to the research of Genetic Programming. The authors used genetic programming approach as a feature selector and classifier to implement bankruptcy prediction models for medium-sized companies. Two sets of input variables were used for prediction models. Also, for feature selector two strategies were defined, based on the statistical relevance of the selected features. An analysis is performed of the improvement obtained with feature selection with both genetic programming-based methods in comparison with the use of complete sets of variables and using genetic programming as a classifier. The proposed classifier is compared with other standard classifiers, and the best results are achieved with the synergy of using genetic programming as a feature selector and as a classifier.

The second paper entitled "Enhancing Network Engineering Capabilities through LLM Fine-Tuning with Automatically Generated Datasets" by Claudiu Traistaru, Florin Pop, Costin Badica, Catalina Mancas, Ionut Muraretu, presented a method for automatically generating domain-specific datasets to finetune open-source LLMs in network engineering. The authors evaluated datasets generated using several open-source LLMs, analyzed the quality of unprocessed knowledge data and the efficacy of cleaning and deduplication methods. The resulting dataset addressed various subjects related to routing, security, and network services.

The third paper entitled "How Gray-Boxed Design Can Improve Explainability in Cloud-Edge Microservice Allocation: Analysis and Case Study" by Jorge Jimeńez García, Ignacio Lacalle Úbeda, Paweł Szmeja, Katarzyna Wasielewska-Michniewska, Przemysław Hołda, Maria Ganzha, Carlos E. Palau Salvador, Costin Bădică, Stefka Fidanova, Marcin Paprzycki, is a kind of survey paper focusing on improvement of explainability in Cloud-Edge microservice allocation. The authors studied the available literature in order to propose a middle ground of mixed AI architectures that combine the performance of blackbox AI models with a more explainable overall architecture. Apart from that they presented an application case of microservice allocation decision over cloud (and cloud-like) infrastructures.

The fourth paper entitled "Audio Feature-based User Profiles for Personalized Music Recommendation: A Dataset-driven Evaluation" by Ionut-Dragos Neremzoiu, Andreea Liliana Bădică, contributes to the area of Personalized Music Recommendation. The authors proposed an experimental content-based track recommendation system, which relies on aggregated features which consider audio feature values from Spotify Data Catalog, track lyrics and popularity ratings. Additionally, they evaluated how relevant the top-5 recommended tracks are to the user profile, and in experimental evaluation they concluded that the recommended tracks are similar to the user's profile.

The fifth paper entitled "Trustless Exchange for Personal Data: Adapting Intellectual Property Trading Security Protocols for Data Sovereignty" by Vijon Baraku, Simeon Veloudis, Iraklis Paraskakis, Poonam Yadav, Rezon Baraku, brings the authors' approach for supporting data sovereignty. For that purpose, they used secure exchange in personal data stores adapting blockchain-based security protocols originally designed for intellectual property trading. They examined how their existing multi-stage verification protocol can be applied to address the requirements of personal data exchange. The proposed innovation supports maintenance of the trustless verification and secure transfer mechanisms

of the original protocol. So, they explored a complementary framework that could enhance existing Personal Data Store architectures contributing to the advancement of data sovereignty in digital ecosystems.

The sixth paper entitled "IoT based Personalized Online Learning Systems (Systematic Mapping Study)" by Edlir Spaho, Betim Çiço, brings systematic overview of IoT Personalized Learning Systems. It is evident that IoT plays an important role in the educational processes as well. The authors presented identified how IoT supports personalization in online learning processes. This mapping study involved screening of more than 6400 articles and 65 of them were identified as having implemented experimental or solution-based research involving IoT. Apart from realizing that the use of IoT in Education to implement personalized learning systems is in its early stages possible gaps in implementing such learning environments are pointed out.

The seventh paper entitled "A Knowledge Graph based Approach for Credit Card Fraud Detection" by George Konstantinos Dimou, Georgia Koloniari, is focused on Credit Card Fraud Detection issues. The authors proposed a novel graph-based approach that constructs a Knowledge Graph from transactional data to model relationships between different entities. A variety of centrality measures, both in an unweighted and in a weighted knowledge graph were calculated in order to capture structural importance. The measures are used to enrich the feature space for multiple Machine Learning models. Comprehensive experiments showcased how the addition of the centrality measures as classification features can significantly improve the performance of classification models.

We gratefully acknowledge all the hard work and enthusiasm of authors, without whom this special section would not have been possible. In addition, we appreciate for the careful study of the selected papers and the constructive comments made by the reviewers:

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Finally, we hope that readers will enjoy the content of this special section, and that it will inspire them to do high quality research in these modern and attractive areas.