Editor's Note

THE International Journal of Interactive Multimedia and Artificial Intelligence (IJIMAI) is a diamond open access journal which provides an interdisciplinary forum in which scientists and professionals can share their research results and report new advances on artificial intelligence tools, theory, methodologies, systems, architectures integrating multiple technologies, problems including demonstrations of effectiveness, or tools that use AI with interactive multimedia techniques. The journal is supported by Universidad Internacional de La Rioja (UNIR) and by all those members of this multicultural community who, with a sense of commitment to the development of science, dedicate their knowledge and time to authoring, editing and reviewing tasks, and without whom this knowledge sharing project would not be possible.

This regular issue begins with a series of five articles covering key advancements in the area of computing vision. The first three propose solutions that are applied in the health and welfare fields. Specifically, the first one targets the diabetic foot ulcers (DFU), which are among the most serious diabetic complications. Kumar Das et al. propose a federated learning-based solution to automatically diagnose DFU from patient images, addressing key common challenges in healthcare applications as data privacy or diagnostic accuracy. With a decentralized learning proposal, machine learning models are trained directly on client devices, where the sensitive patient data is kept, avoiding the privacy concerns that arise in centralized systems. The solution uses a hybridized data augmentation technique together with a lightweight convolutional neural network (CNN) running on resource constrained devices, which shows good performance. Therefore, the proposal has the potential to provide accessible, affordable and privacy-preserving diagnostic support of DFU, even in developing regions.

The research by Irfan et al. focuses on Alzheimer's disease, a common type of dementia that is expected to affect more and more people in the coming years. This research aims to deploy deep learning methods to determine if they can extract helpful Alzheimer's disease biomarkers from magnetic resonance imaging (MRI) and classify brain images into Alzheimer's disease, mild cognitive impairment, and normal cognitive groups. Specifically, various CNN are trained to predict Alzheimer's disease using different views of MRI images, including sagittal, transverse, and coronal views. Authors propose an intelligent probabilistic approach to select slice numbers for the three MRI views to reduce computational cost. With hyperparameter tuning, batch normalization, intelligent slice selection and cropping, and combination of the views, an accuracy of 92.21% is achieved, showing better performance than related studies.

To improve the quality of life of the elderly, Liu et al. propose a fall detection scheme based on human skeleton nodes that could facilitate real-time fall detection, with the corresponding needed immediate help. In their research, a hybrid model based on spatial-temporal graph convolutional network (ST-GCN) and YOLO algorithm is proposed for multi-person fall detection. The first network is used to detect the fall action, while the second is used for accurate and fast recognition of multi-person targets. Optimization methods are also used to achieve real-time performance. Authors use both public single-person datasets and their own multi-person dataset in their experiments. They find their proposal has high detection accuracy under better environmental conditions, compared to state-of-the-art schemes, and outperforms other models in terms of inference speed.

Next article by Su et al. presents a solution to detect human-object interactions (HOI) in images. HOI detection goes a step further in object detection in computer vision, detecting the human and the object and extracting the semantic relationship between both. The authors propose a spatial-aware multilevel parsing network (SMPNet) that uses a multi-level information detection strategy, including instance-level visual features of detected human-object pair, part-level related features of the human body, and scene-level features extracted by the graph neural network. The experiments with two datasets show better performance than other state-of-the-art works.

Also on computer vision, next article focuses on the problem of semantic interpretation of paintings. Some painters want to mean something with their work and they introduce signifiers that convey these meanings in their paintings. The research by Aslan and Steels focuses on the expression of meaning of paintings, exploring a comparative method to find the relationship between the source of a painting (e.g. a photography) and the painting itself. The authors investigated possible methods for aligning a painting and its source and used edge detection and the construction of comparative edge maps, to detect centers of interest. The article proposes a pipeline tested using paintings by the contemporary painter Luc Tuymans, focusing on showing the utility of the comparative method for semantic interpretation of a painting.

In the following article, we move from the area of computer vision to another fast developing area, which is natural language processing (NLP). In recent years, this area has experienced great advances due to large language models (LLM), and a new discipline called prompt engineering has emerged, whose purpose is to develop and optimize prompts for the efficient use of these LLM. Fine tuning by using the reinforcement learning from human feedback (RLHF) allows continuous improvement in the results obtained by the LLM. Pulari et al. propose a human selection strategy to improve the RLHF process in the news summarization problem. Multi-objective optimization is used for the trade-off between various objectives. Besides an evaluation metric H-Rouge (RH) is proposed for scenarios in which humans need to provide reviews and feedback. These human evaluations will facilitate an improved user experience, accurate summarizations, and reduced training costs.

The following articles correspond to a monograph section on the Effects of Culture on Open Science and Artificial Intelligence in Education, compiled and edited by Tlili, Burgos and Kinshuk. In the first article of this monograph, Tlili and Burgos discuss about the link between human and AI hallucinations and how its understanding could help to develop effective and safe AI systems to be used by everyone. Besides, they introduce the topic and the different articles of this monograph with insightful discussions on how cultural factors influence the adoption and implementation of open science and AI-driven technologies.

We hope that this issue fosters meaningful discussion and inspires further interdisciplinary research in these rapidly evolving fields.

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