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EDITORIAL

Introduction to meta learning for internet of multimedia things

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Artificial Intelligence is in transition as the fast convergence of digital technologies and data science holds the promise to liberate consumer data and provide a faster and more cost-effective way of improving human initiatives. Particularly, Artificial Intelligence (AI) is heavily influencing Internet of Multimedia Things (IoMTs) nowadays. The AI driven-based Internet of Multimedia Things have the potential to reshape the expectations of human's actions, the way that companies' stakeholders collaborate, and revamp business models in the various industries.

However, the use of AI driven-based Internet of Multimedia Things comes with its concerns that lead user with distrust and ethical concerns. With inappropriate use of AI widespread access to consumer-generated information has brought negative impacts to individuals, organizations, industries, and society. For example, the collection and utilization of training data by AI algorithms give rise to serious issues where consumers could suffer from privacy invasion, fraud, ineffective and offensive or lack of control over IoMTs applications. If such ethical dilemma and concerns are not being correctly addressed when implementing meta for Internet of Multimedia Things, not only it will generate negative impacts on the general public, but also may lead to the potential loss of credibility for products, brands and hamper the company's reputation.

To tackle these challenges, the data protection regulations in many countries have come into force such as the Data Protection Act 2018, which is the UK's implementation of the General Data Protection Regulation (GDPR) formulated by the European Union, and Act on the Protection of Personal Information (APPI) in Japan. These regulations have the potential to improve consumers' confidence in sharing personal information with engineers in the development of autonomous vehicles. Nevertheless, it may become a possible solution to study general AI for IoMTs. Although there are many researches and advancements on meta-learning, less work is for IoMTs applications. The general AI solutions (e.g., meta-learning) for different devices-based IoMT applications are especially needed in the future cyber-physical-based world.

From the papers submitted to this special issue, finally, 9 high-quality articles were selected. Each paper was peer reviewed by two or more experts during the assessment process. The selected articles have exceptional diversity in terms of meta-learning and multimedia techniques and applications. They represent the most recent development in both theory and practice. The contributions of these papers are briefly described as follows.

1 Papers in this special section

In the first paper [1], the authors design a novel supervised CRC method entitled locality-constrained weighted collaborative-competitive representation-based classification (LWCCRC). A competitive constraint is introduced to enhance pattern discrimination among the categorical collaborative representations. The experimental results demonstrate that the proposed LWCCRC significantly outperforms the recent state-of-the-art CRC methods.

[2] develops a novel few-shot fine-grained classification method, which learns to model the inter-class boundaries in human-like style, i.e., extracting key-part structure information of objects and performing part-by-part comparison. Extensive investigations are conducted to verify the contributions of the key components of this method.

In the third paper [3], the authors propose a small target deep convolution recognition algorithm which was based

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on the improved YOLOv4 network. Experiments show that compared with the original YOLOv4, the average detection speed and accuracy of the improved network are increased by about 30% and 7% respectively.

In the third paper [4], a hybrid attention semantic segmentation network (HAssNet) which can extract the target and its surroundings through a large receptive field for multi-scale targets is put forward. Experimental results on an open remote sensing dataset show that HAssNet achieves average 6.7% improvement in mIoU than the state-of-the-art segmentation networks.

A global attention network for cosaliency detection to extract individual features from the feature enhancement module is proposed (FEM) in [5]. Extensive experiments demonstrate the effectiveness of the proposed model, in most cases FEM method exceeds the state-of-the-art methods.

In the sixth paper [6], under a partially shared assumption, the authors propose a better disentanglement of the content and style latent space using a domain-specific style latent classifier and a domain-shared cross-content latent discriminator. This method can be easily embedded into any latent space disentangled model of an image-to-image translation for a few-shot setting.

In the seventh paper [7], in order to maintain the convexity of the cost function for more accurate solutions, the authors introduce the generalized minimax-concave (GMC) regularization to approximate the $\ell 0$-norm regularization. After adopting the ARL criteria, the average localization error decreased from 0.098 to 0.053 m in the 0.25×0.25 m grid scene, with an increased rate of 45.9%. This is the best performance compared to state-of-the-art framework.

In the paper [8], the authors propose a multi-stage fusion instance learning method (MFIL) for inferring anomalous event pattern and predicting anomaly appearance in videos. Moreover, the author proposes object-aware model and action-aware model to represent regularities of human objects and actions among frames exploiting cascaded deep network models.

In the ninth paper [9], the authors propose a complete interest propagation from part (CIPFP) method for VROID, which exploits semantic parts and propagates interest along part-instance-relation. This paper also conducts substantial experiments to validate the effectiveness of the CIPFP method and the components in CIPFP.

2 Final thoughts

In conclusion, we would like to express gratitude to all the authors for their contributions to the special section and all the reviewers for their careful reviews. We also appreciate the support and help from the editorial staff and the Editor-in-Chief, Xizhao Wang.

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