



# Special issue on artificial intelligence-based techniques and applications for intelligent IoT systems

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The progression of Internet of Things (IoT) has influenced several application areas during last decade and is expected to multiply further. With a massive amount of data being generated by an increasing number of applications, future systems can learn to be more intelligent and to guarantee better services for users. The techniques of artificial intelligence (AI) can help in building such systems, as they deliver an excellent advantage for studying the essential characteristics of the system as well as data collected from it. This Special Issue aims to provide a comprehensive overview of the state-of-the-art development in IoT systems; it also aims to explore novel concepts and practices with a long-term goal of fully automated systems via the technological advances of AI in a wide range of applications.

A maximal-entropy-attention-based convolutional neural network (MEA-CNN) framework is proposed by Pan et al. A multifeature video-based modular robotic arm motion device was built by Zhao, and the relevant performance of the robotic arm was verified by experiments. An IR image dehazing algorithm based on multiple-factor fusion cascade network (MFFCN) is proposed by Tang et al. which includes multi-patch image encoder, multi-channel feature enhancement module and multi-level feature fusion module to directly remove the haze. Sun and Zheng propose an improved deep convolutional neural network based on HRNet and PSPNet to segment and realize deep scene analysis and improve the pixel-level semantic segmentation representation of high-resolution remote sensing images. Gan et al. suggest an autonomous trajectory planning technique for cleaning an object's

surface based on RGB-D semantic segmentation, which enables the robotic arm to move the cleaning mechanism on the object's surface smoothly and steadily and finish the cleaning process.

Yin et al. use the dual attention mechanism to quantify investor preferences, then use deep neural networks to learn the nonlinear interaction of item features, and then combine the collaborative filtering mechanism to model investor preferences and item features to predict the recommendation list. Yao et al. propose a real-time dynamic visual SLAM system (RTDSLAM) based on ORB-SLAM3 to realize accurate pose estimation of the camera in indoor dynamic environments. Miao et al. aim to study a method of stone inscription calligraphy recognition based on convolutional neural networks. Liu et al. design a human abnormal behavior recognition system based on deep learning and dual-channel C3D. Wu et al. propose a novel approach that designs a bidirectional feedback framework (GKB) between optimized Gaussian mixture model and kernel correlation filter to enhance vehicle detection.

Fan et al. realize the noise point elimination of point cloud data by studying reconstruction technology of free-form surfaces using a geometric convolutional neural network model. Dai predicts the export volume of foreign trade through a back-propagation neural network (BPNN). Xu and Wang aim to realize the tracking control of the trajectory of a robotic arm through a neural network algorithm. Wang and Shi study the expression dynamic capture and 3D animation generation methods based on deep learning. Because of the above requirements, a personalized learning path model based on a knowledge network is proposed by Zhong et al.

Zhao and Wang study the optimization model of urban emergency resource scheduling, which uses the deep reinforcement learning algorithm to build the emergency resource distribution system framework, and uses the deep Q Network path planning algorithm to optimize the system, to achieve the purpose of optimizing and upgrading the efficient scheduling of emergency resources in the city. Fan

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et al. analyze and study the characteristics of subway vehicle driver controllers and their design methods from three aspects: mechanical, electrical, and software-assisted design. Nie and Li study the detection, identification, and experimental simulation of quasi-frequency hopping signal under multi-fixed frequency interference. Gou et al. aim to construct a novel pipeline by using machine vision technique to improve the quality of driver fatigue detection based on forehead EEG. To improve the movement naturalness and coordination of computer animation virtual idol characters, a virtual character interaction control method in virtual rehearsal is analyzed and proposed by Shi and Wang.

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