

Preface to JAISE 15(4)

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1. This issue

This regular issue of JAISE is composed of six articles:

Adaptive path planning for unknown Environment monitoring by N. Gomathi and K. Rajathi, proposes an adaptive path planning framework to address a new challenge known as the Unknown Environment Persistent Monitoring Problem. To map an unfamiliar location, a 3D visualization tool for Robot Operating System and the open access GMapping software package are used. The experimental results suggest high-precision mapping at lower costs. A Hybrid SLAM and A Star algorithm is built for path planning based on the event-oriented modelling, allowing unmanned ground vehicles to continually monitor the perspectives of the path. The simulation results and analyses show that the proposed strategy is feasible and advantageous compared to the state-of-the-art.

Seq2seq model for human action recognition based on skeleton and two-layer bidirectional LSTM by S. Wei, J. Zhao, J. Li, and M. Yuan, presents a skeleton and two-layer bidirectional LSTM based lightweight Seq2Seq model for human action recognition. The model was developed and tested on a large real-life action category of a video dataset, and the results were compared with other state-of-the-art methods in the literature, resulting on improved capture of different contextual information of the video sequence in most models and require less time for training. The article also accurately identifies specific aspects of the models which require further research.

Prediction-based channel assignment for minimizing channel switching in mobile WBANs by P. Pradhan and S. Bhattacharjee, explains a channel assignment scheme in a dynamic and coexisting wireless body area networks environment, which selects the free channels for cases when channel conflict occurs. The proposed method assigned the channels to the networks during switching based on neighbourhood prediction, mobility, and current channel assignment. The proposed model is applied to capture the mobility of the network and machine learning algorithms are used for neighbourhood prediction. Simulation results highlighted that the proposed method is more resilient in a dynamic environment and minimizes the number of channel switches and network delay than existing channel assignment algorithms.

An obstacle aware efficient MANET routing with optimized Bi-LSTM and multi-objective constraints on improved heuristic algorithm by R. Bhavadharini, P. Beulah, C. Kumar and K. Ravi, explored a novel obstacle-aware Mobile Ad Hoc Networks routing using a heuristic-aided deep learning approach. Data related to the mobile nodes were collected from standard datasets. Links were established between the nodes for data communication. The scenario comprised of obstacles, which can degrade performance. To avoid the obstacles and verify the legitimate node or path, an OBi-LSTM model was newly deployed to predict efficient link connectivity. Furthermore, to provide optimal predictive results, the hyperparameters in the network model were optimally tuned using the developed AHHO algorithm. After the link connectivity was predicted, the routing process was initiated. Here, the optimal path or optimal routing has been optimized by the proposed AHHO algorithm.

To offer efficient routing, multi-objective constraints were utilized to develop the objective function. Also, different measures like accuracy, delay, power consumption, and distance were considered to analyze the network performance showing increased efficiency.

Memoization based priority-aware task management for QoS provisioning in IoT gateways by G. Beniwal and A. Singhrova, proposes a framework for resource allocation in a fog-cloud-IoT environment. This framework of the smart gateway has been divided into two phases: the scheduling and offloading phases. A DP-TSA algorithm has been proposed for the prioritization phase, where a smart gateway allocates dynamic priorities to the incoming tasks and maintains the tasks in multi-level feedback queues. The second phase is offloading, where the tasks are offloaded to the fog node or cloud based on their computational needs. A memoization-based algorithm, known as MBFA, has been proposed to schedule the task at IoT gateways efficiently and offloaded for further processing, ensuring that no computational node is over or under-loaded. Results proved that the proposed work outperforms the traditional algorithms and simple gateway scenario and has also improved QoS parameters namely average latency, average energy consumption, and average throughput.

Prediction of regional carbon emissions using deep learning and mathematical-statistical model by Y. Mu, K. Gao and R. Du, provides an effective method for predicting regional carbon emissions. The regional carbon emission sources are calculated by dividing them into dynamic and static objects. First, for dynamic objects, the BDS is used to obtain the update of the motor vehicle location and apply the speed and emission model for calculation. Then, for static objects, a target detection deep-learning neural network based on remote sensing is used for building recognition. The ARIMA time series model is used to fit the historical data of buildings to predict the current carbon emissions value. Finally, the regional carbon emissions data is summarized. The prediction data of an industrial park in Tangshan, Hebei Province, China, is compared with the prediction data of a carbon satellite. The results show that this method can effectively predict carbon emissions and, compared with state-of-the-art ones, it has higher universality and accuracy.

2. Upcoming issues

The following is a list of upcoming issues of JAISE:

- March 2024: Thematic Issue on “Sensing, Decision-Making and Economic Impact for Next-Generation Technologies”.
- June 2024: Regular Issue.
- September 2024: Thematic Issue on “Location-based Services for Active Assisted Living”.
- December 2024: Regular Issue.

More information on the call for papers to the future issues is available on the webpage of JAISE at:

<https://www.iospress.com/journal-of-ambient-intelligence-and-smart-environments>