Editor's Note

With the rapid development of information and communication technologies, artificial intelligence and IoTs, more and more advanced technologies, such as machine learning, reinforcement learning, neural networks and fuzzy systems, have been introduced into industrial practices. The application of advanced technologies has greatly promoted the process of industrial revolution. However, there is big gap between controlled simulation and real evolving environment, which results in the unsatisfactory performance of the typical algorithms in practical environments. For example, in Underwater IoTs, a dynamic and uncertain marine environment can cause equipment damage, resulting in huge financial losses. Therefore, improving the robustness and adaptability of algorithms and systems, and proposing new solutions in practical applications to meet the requirements of self-developing, self-organizing, and evolving systems is essential to promote intelligent industrial applications.

This Research Topic aims to collect researches focusing on addressing the problems of evolving system modelling, clustering, classification, prediction and control in non-stationary, unpredictable environments. The scope of this topic includes: (1) Robustness of environment modeling in evolutionary system, (2) Robustness of artificial intelligence algorithms, (3) Adaptability of neural networks and systems, (4) Prediction of intelligent algorithms in dynamic environments, (5) Improvement of robustness in deep learning algorithms, (6) Interpretability of predictive models in dynamic environments, (7) Application of AI technology in Industrial Internet of Things, (8) Uncertainty in Intelligent Transportation System, (9) The dynamic environment of Underwater Internet of Things, (10) Applications and migration of intelligent algorithms.

Specifically, the present Special Issue includes the topics described below.

Zhang et al. proposed a dataset containing a variety of elements. They construct a corresponding out-of-distribution test set. They explored the distribution characteristics of efficient datasets in terms of angle element, and confirmed that an efficient dataset tends to contain samples with different appearance.

Roy et al. discussed using the Internet of Medical Things in the COVID-19 crisis perspective. This paper suggested an ensemble transfer learning framework to predict COVID-19 infection, which predicted the COVID-19 infected people with an F1-score of 0.997 for the best case.

Hurtado et al. presented a novel approach for Human Activity Recognition (HAR) in healthcare to avoid the risk of mortality caused by physical inactivity. The model took advantage of the large amount of unlabelled data available by extracting relevant characteristics.The proposed approach can properly classify movement patterns in real-time conditions.

Saxena et al. proposed a network centrality based approach combined with graph convolution networks to predict the connections between network nodes. They also proposed an idea to select training nodes for the model based on high edge, which improved the prediction accuracy of the model.

Arroni et al. proposed an attention-based model that used the transformer to predict the sentiment expressed in tweets about hotels in Las Vegas. They crafted a transformer architecture model much simpler and smaller than the mentioned models for specific problems, which does no need a whole language representation.

Chen et al. proposed a new spatio-temporal attention graph convolution network (STAGCN) for sea surface temperature prediction. STAGCN can capture spatial dependance and temporal correlation. Experiments showed that the model can capture the spatio-temporal correlation of regional-scale sea surface temperature series and outperforms models under different sea areas and different prediction levels.

Andueza et al. used time series models, i.e., autoregressive integrated moving average and seasonal autoregressive integrated moving average to forecast the impact of COVID-19 on sales of cigarette in Spanish provinces.

Maestro et al. proposed a blockchain-based decentralized architecture for cloud resource management systems. They analyzed and compared the characteristics of the proposed architecture concerning the consistency, availability, and partition resistance of architectures that rely on Paxos/Raft distributed data stores. And they demonstrated that the proposed blockchain-based decentralized architecture noticeably increased the system availability.

Sinha et al. proposed a method to select web data sources for web data warehouse. This work was based on the probabilistic analysis of SAW and TOPSIS, which deal more efficiently with the dynamic and complex nature of web.

We would like to thank all of the contributors to the research topic including authors, reviewers, and the IJMAI editorial and production offices.

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DOI: 10.9781/ijimai.2023.02.013