Editorial

Applied machine learning and management of volatility, uncertainty, complexity & ambiguity (V.U.C.A)

Machine Learning (ML) is a superset of techniques which are being used for solving generic problems such as classification, regression, recognition and prediction. It is a branch of artificial intelligence, gives machines the ability to learn by their own without human feedback. Recently, ML has gone one step ahead to address the issues such as Volatility, Uncertainty, Complexity and Ambiguity of any business or real world problem. This special issue shall cover various Machine Learning techniques applied to the problems associated with the risk factors, such as Volatility (rapid rise and fall in the responses), Uncertainty (unpredictable situations/ conditions), Complexity (difficulties in problem understanding) and Ambiguity (confusion in situations/ surrounding conditions).

VUCA is an acronym that stands for volatility, uncertainty, complexity and ambiguity, a combination of qualities that, taken together, characterize the nature of some difficult conditions and situations. Volatility refers to the propensity for changing from one state to another. Uncertainty refers to the lack of specific information, which can be found by answering specific questions. Complexity refers to the difficulties in problem understanding. Ambiguity refers to the confusion in market situations. All the aforesaid four factors are inter-related to each other which can definitely affect the growth of an industry or business organisation. These challenges can be correlated to the expected future conditions and getting ready to mitigate through these situations to survive in the competitive business world. One of the effective ways to manage V.U.C.A. is integrating machine learning (ML) techniques into various problem areas such as business, networking, forecast-

ing, traffic control, and process industries and so on. ML is a superset of techniques which are being used for solving generic problems such as classification, regression, recognition and prediction. It is a branch of artificial intelligence, gives machines the ability to learn by their own without human feedback. Recently, ML has gone one step ahead to address the issues such as Volatility, Uncertainty, Complexity and Ambiguity of any business or real-world problem. Some of the most widely used methods for solving the above-mentioned problems classified into supervised and unsupervised learning methods which include statistical models, inductive logic programming, fuzzy logic, decision and regression trees, probabilistic networks, deep learning, neural networks, case-based methods and ensemble methods etc.

Volatility: Volatility is a concept that is created inside an organization; hence, the possible causes of change are known. This also refers to the different situational social-categorization of people due to specific traits or reactions that stand out during that particular situation, such as political instability, flood, drought or spread of epidemics.

Uncertainty: It is a concept that comes from outside the organization; hence, the cause and effect of risks are unknown. The lack of knowledge about the situations causes uncertainty in any field which results an unpredictable future and affects the long-term grown of that organization. Some of the factors that may cause uncertainty are never-ending customer needs and changes in customer's tastes and preferences; technological changes; introduction of new trade policies and multiple barriers to trade; launching of new product as a substitute of currently used product in market etc.

Complexity: With the rapid industrialization, complexity arises due to the interconnected parts, networks and procedures within the organization; the external business environment which might even be unidentifiable and contradicting with each other and lead to complexity in decision-making. The complexity may arise due to outsourcing activities. Some of them are human resource management, facilities management, supply chain management, accounting, customer support and service, marketing, computer aided design, research, content writing, engineering, diagnostic services etc. and induction of new supply chain with the introduction of new product range in production.

Ambiguity: A situation is called ambiguous, when information is incomplete, contradicting or too inaccurate to draw clear conclusions. More generally it refers to fuzziness and vagueness in ideas and terminology. The more ambiguous the world is, the harder it is to interpret. If the problem statement lacks clarity, confidence in probability assessments and the diversity of potential results in which the outcome cannot be clearly described; then it is termed as ambiguity in business environment. E.g. when a new product or plan or technology is introduced in the market, then the diversity in customer's expectations and behaviours may cause ambiguity in decision making to an organization.

In this special issue, we have covered 51 articles pertaining to all this four domains. Let us begin with the first section as Volatility, followed by Uncertainty, then Complexity and at the last but not the least Ambiguity.

Section-I: Volatility

The first paper in this issue entitled "*Predicting Short-term Traffic Flow in Urban based on Multivariate Linear Regression Model*" by Dahui Li proposed a short-time urban traffic flow prediction based on multivariate linear regression model. He has claimed that his model can overcome the problem of low accuracy and time-consuming prediction.

The second paper entitled, "*Early Warning for Abnormal Load Fluctuation of Wind Farm Load based on Probabilistic Neural Network*", by Zhongli Shena and Yi Zuoc, proposed a model to forecast the abnormal load fluctuation in wind farm based on probabilistic neural network. The authors have claimed that the error rate of early warning was greatly reduced while comparing with the method

based on alternative data and the fitting index of early warning. The authors developed a function based on fuzzy reasoning to classify the severity of wind farm anomalies by considering the forecasting results.

The third paper entitled "*Power Instability Prediction Method for Wind Turbine based on Fuzzy Decision Tree*" by Jinkun Sun, proposed a prediction method for wind turbines based on fuzzy decision tree. The author has used the hill climbing algorithm to search and control the maximum power of wind turbine, and predicted the wind turbine instability by Fuzzy Decision Tree method.

Yan Sun et al. in their paper entitled, "*Optimal Defence Strategy Model Based on Differential Game in Edge Computing*", proposed a defence strategy model for edge computing based on differential game theory to realize the balance between reward and energy consumption cost of edge nodes in the deployment of defence measures. The authors have analysed the optimal defence strategy and payoffs of edge nodes under grand coalition, intermediate coalition, and non-cooperation as well as the payoffs for various conditions.

The next paper entitled, "*Analysis of vibration high-frequency dynamic characteristics of wheel less rail vehicle system based on fuzzy logic control*" by Zhang Yirui and Su Jian. They have proposed a method based on fuzzy logic control and neural network algorithm to analyse the high frequency dynamic characteristics of ballast less track wheel-rail vehicle system. The authors developed a model by using linear discrete elastic-yellow damper elements to analyse the high frequency dynamic characteristics, utilising the Rough Set block Neural Network.

Section-II: Uncertainty

The first paper in this section entitled, "*Social Network Visual Simulation for Process Reengineering of Construction Change Management under Building Information Modelling Technology*", by Yinglong ZHANG proposed a reengineering construction change management based on BIM technology to improve the information integration. The authors verified the effect of process reengineering by UNCINET, which is a visual analysis tool for Social network analysis (SNA) to analyse and compare the traditional as well as BIM based organizational structure. The author has shown the modelling results of SNA with the role of each organizational unit which help in strengthening organizational coordination and

information exchange in construction change management process.

The next paper entitled, "*Influence Model of Wind Power Capacity in Load Response System under Smart Grid Environment*", by Yan Liu et al., proposed a multi-layer scheduling for two-dimensional operation model. They have proposed the load demand in smart grid environment considering uncertainty in wind power. The authors have carried out the experiment and reported that the method helps in reliable wind power consumption, by ensuring economic and reliable condition.

The next paper entitled, "*Uncertainty prediction method for traffic flow based on K-nearest neighbour algorithm*", by Lingmin Yang, proposed a traffic flow uncertainty prediction method based on K-nearest neighbour algorithm. This method is used to overcome the problem of existing traffic uncertainty prediction. The author developed a dataset comprising of four datasets namely the original dataset, classification centre dataset, k-nearest neighbour dataset and intermediate search dataset for the prediction process. The author has used multivariate linear regression to assign weights to state variables, and k-nearest neighbour algorithm and Kalman filter to update the weights to adapt the uncertainties of traffic flow until the predicted values were obtained.

The paper entitled, "*Short-term Forecasting Method for Dynamic Traffic Flow based on Stochastic Forest Algorithm*", by Heniguli WUMAIER et al., proposed a stochastic forest algorithm to forecast short-term dynamic traffic flow to overcome the problems of low forecasting accuracy and computational time-consumption in traditional short-term forecasting methods. They have claimed that their method helps to complete the data pre-processing before the prediction of traffic flow by selecting short-term forecasting equipment for dynamic traffic flow, eliminating invalid data from the collected data, and normalizing the available data. They have combined the forecasting model to optimize the output of the pre-treatment results and complete the dynamic traffic flow rate forecasting. In addition, they have also used the stochastic forest algorithm to train the sampling set of flow rate decision tree and generate short-term flow decision tree to realize short-term forecasting.

Xie Lechen and Wang Wenlan in their paper entitled, "*A risk investment evaluation method based on dynamic Bayesian network and fuzzy system*", proposed a risk investment evaluation method of forestry rights mortgage of farmers based on Dynamic Bayes Network (DBN) and fuzzy system. The authors have used DBN based risk investment evaluation system for forestry rights mortgage of farmers to improvise the risk evaluation system and also used the normalization and factor analysis methods to pre-process the model index. They have also designed the composition and calculation mode of the fuzzy function module and DBN module.

The next paper entitled, "*Application of hybrid GA-PSO based on intelligent control fuzzy system in the integrated scheduling in an automated container terminal*", by Meisu Zhong et al., proposed an integrated scheduling of gantry cranes (QCs), automated guided vehicles (AGVs) and automated rail-mounted gantry (ARMG) to improve the working efficiency and to save the energy of automated terminals. Based on the loading and unloading operation mode, the authors have developed the mixed integer programming (MIP) model with the goal of minimizing the ship loading and unloading time. They have claimed that the hybrid GA-PSO (HGA-PSO) algorithm with adaptive auto tuning is better than the other algorithms in terms of solution, time complexity and quality.

Feng Bing in his paper entitled, "*Fuzzy clustering discrete equilibrium analysis on the promotion of government venture investment to enterprise innovation*", proposed a government risk investment model using fuzzy clustering discrete optimization. To improve the government risk investment, the author considered Markowitz theory based general government risk investment model and by combining the market value constraint as well as the upper bound constraint. Further the author used the fuzzy clustering discrete algorithm to analyse the government venture investment. The author also analysed the performance of fuzzy clustering model.

The next paper entitled, "*A Group Authentication and Privacy-preserving Level for Vehicular Networks based on fuzzy system*", by Cheng Xu et al., proposed a secure and efficient group authentication and privacy-preserving scheme for vehicular networks based on fuzzy system. The authors have used the group authentication and privacy-preserving level (GAPL) with the aim to improve the security functionality of these vehicular networks. The authors claimed that their proposed scheme can greatly reduce the number of control message transmissions from mass vehicular equipment (VEs) to the network and substantially avoid overhead in LTE-A-based vehicular networks.

The next paper entitled, "*Performance evaluation of enterprises' innovation capacity based on fuzzy system model and convolutional neural network*", by Abuduaini Abudureheman et al., proposed a performance evaluation method of enterprises' innovation capacity based on deep learning fuzzy system model and convolutional neural network analysis of innovation network. The authors have highlighted the six dimensions of main resource such as input, technology out-turn, process management, product performance, social value and commercial value, which were used to design the performance evaluation index system. They have also combined the analytic hierarchy process and the convolutional neural network algorithm to use the convolutional neural network for effective weight allocation, for quantitative processing of all indexes, and to transform the subjective human judgment into objective statistical data.

Cao Yonglei and Zhang Xiaodong in their paper entitled, "*Permanent Magnet Synchronous Motor Algorithms based on Nonlinear Identification Generalized Predictive and Intelligent Fuzzy Control System*", proposed a control strategy of permanent magnet-oriented field synchronous motor based on intelligent fuzzy control system and generalized predictive control with non-linear identification. The authors divided the accessor into stabilization control part and intelligent control part. They have used the input of traditional feedback control as the stabilization control part, while incorporated the feed-forward into the intelligent part to compensate for the uncertainties of repetitive load torque and model parameters.

The next paper entitled, "*Wireless sensor network model with uncertain delay and packet loss based on Intelligent fuzzy system*", by Yuanbo Shi et al., proposed the memory robust H_∞ controller based on linear matrix inequality (LMIs) to solve the uncertain time delay and packet loss. The authors designed their model with questionable time lag and packet loss and proved the stability of the system by the augmented Lyapunov functional with the LMIs method.

The next paper entitled, "*Numerical Simulation of Three Dimensional Flow in Yazidang Reservoir Based on Image Processing*", by Lingxiao Huang et al., proposed a 3D $k - \varepsilon$ mathematical model to analyse the water flow movement of Yazidang Reservoir under four working conditions through non-structural grid finite volume method and SIMPLEC algorithm in combination with reasonable initial conditions. This model efficiently analysed the flow field on the surface and at the bottom of the reservoir.

Section-III: Complexity

Hongyan YU et al., in their paper entitled, "*The Effect of Experienced Buyers' Feedback on Consumer Behavior: Evidence from the Largest Online Marketplace in China*" proposed a model to examine three interrelated stakeholders of e-Commerce platforms such as experienced buyers, future buyers and the online sellers in terms of purchasing behaviours and sales that helped the buyers to avoid fake online review from a market structure perspective. They have claimed that the experienced buyers and their positive reviews amplified future buyers' purchasing and promoted corporate sales.

Ramamani Tripathy et al. in their paper entitled, "*Cellular cholesterol prediction of mammalian ATP-binding cassette (ABC) proteins based on Fuzzy C-Means with Support Vector Machine algorithms*", proposed a model based on Fuzzy C-Means with Support Vector Machine algorithm for prediction of cellular cholesterol with ABC genes. The model extracted the transmembrane sequence matching of forward/backward cholesterol motif to predict cellular cholesterol of ABC transporter and the protein data information of ABC transporter. The authors also designed a cholesterol dictionary using CRAC/CARC algorithm and claimed that the model performed well for valid motif of different amino acid sequences which has clinical relevance in human being for multi-drug discovery.

Yongsheng Zonga and Guoyan Huanga in their paper entitled, "*Application of artificial fish swarm optimization semi-supervised kernel fuzzy clustering algorithm in network intrusion*", proposed a hybrid kernel fuzzy C-means clustering algorithm based on artificial fish swarm optimization (AFSA-KFCM). The authors have used the kernel function to change the distance function in the traditional semi-supervised fuzzy C-means clustering algorithm, so as to improve the probabilistic constraints of the fuzzy C-means algorithm. They have claimed that the AFSA-KFCM clustering algorithm was better than the traditional algorithm in terms of clustering accuracy and time efficiency in the Wine and IRIS public datasets.

The next paper entitled, "*Encryption Algorithm for Network Communication Information based on Binary Logistic Regression*", by Bo Su et al.,

proposed a network communication information encryption algorithm based on binary logistic regression. The authors claimed that the network communication information sequence was simulated through the model and the fusion tree was constructed. They have established four phases such as system initialization stage, data preparation stage, data fusion stage and data validation stage to encrypt the generated network sequence.

The next paper entitled, "*Decision Tree Classification Algorithm for Non-equilibrium Data Set based on Random Forests*" by Peng Wang and Ningchao Zhang, proposed a random forest-based decision tree classification algorithm for non-equilibrium data set. In their paper, the authors have used wavelet packet decomposition to denoise non-equilibrium data and combined SNM algorithm with RFID to remove redundant data from data sets. The authors claimed that their algorithm can handle the unbalanced data set for classification, solved the problem of mass information classification in modern society, and improved the level of information processing.

Haiyan Hu and Chang Su in their paper entitled, "*Modeling of Network Communication Instability based on K-means Algorithm*", proposed a model on network communication instability based on K-means algorithm to overcome the instability and complexity characteristics of network communication. The authors used the network efficiency function to quantify the network invulnerability as well as to find the most vulnerable nodes in the network, and strengthen them to achieve efficient control over network invulnerability.

The next paper entitled, "*Prediction of Traffic Flow with Small time granularity at intersection based on Probabilistic Network*" by Wenbin Xiao et al., proposed a prediction method for traffic flow with small time granularity at intersection based on probability network. The authors claimed that the method collected, analysed and processed the traffic data such as cross-section flow, section traffic flow velocity data, traffic density, road occupancy, section delay and steering ratio by using RFID technology. They have also used Bayesian probabilistic network and K-nearest neighbour method to predict the traffic.

The next paper entitled, "*Public service hot issue discovery with binary differential evolution algorithm based on fuzzy system theory*" by Liang Danqing et al., proposed a detection method based on geographic information flow anomaly to detect problems of non-specific hot events. The authors have used fuzzy system theory and the *word vector semantic clustering* for features selection from social media data. The authors have claimed that their method gives the empirical rules for discovering hot events based on the change of information flow intensity.

The next paper entitled, "*Spatial-temporal dynamic simulation of anti-noise urban expansion based on fuzzy intelligent control system and GIS*" by Zhou Liangliang, proposed model based on FHWA model of the Federal Highway administration in combination with the geographic information system (GIS) and Fuzzy intelligent control system for the traffic noise in the urban road. The author claimed that the model is capable of analysing and calculating the traffic noise in urban areas and render the predicted results on the GIS map, and formed a traffic noise map, which visually display the pollution degree and distribution map of the traffic noise in urban areas.

Ma Chao et al. in their paper entitled, "*Intelligent Interaction design research based on block chain communication technology and fuzzy system*", proposed a multi-connection multi-factor communication tree algorithm MMWT based on communication weight. The authors have analysed the problem of block chain data transmission from three aspects such as improving the efficiency of data communication, ensuring the reliability of transmission, and improving the fairness of service as well as proposed different block chain data communication performance optimization strategies by considering the constraints of node communication capability, node trust, weight, priority of service request and other influencing factors.

Dai Lili et al. in their paper entitled, "*Public opinion analysis of complex network information of local similarity clustering based on intelligent fuzzy system*", proposed a model of network public opinion for the complex social network. They have used the modelling, simulation, empirical analysis, fuzzy systems and other research methods by considering the reasonable abstraction of the main behavioural characteristics, behavioural motives and network relations of network users to build the model as well as analysed the influential mechanism of the dynamic evolution of online public opinion network.

The next paper entitled, "*Forecast of export demand based on artificial neural network and fuzzy system theory*" by Jiang Bin and Xiong Tianli, proposed a prediction model by combining the neural network with the fuzzy system theory forecast the index system of foreign trade export based on the

analysis of the research results. The authors proposed the evolutionary morphological neural network (EMNN) model to address the issues of fuzziness, non-linearity and high dimensions and deals with modelling of export prediction.

He Chan and Yan Nai-He in their paper entitled, "*A pre-treatment method of wastewater based on artificial intelligence and fuzzy neural network system*", proposed a pre-treatment method of industrial saline wastewater based on Artificial Intelligence and fuzzy neural network analysis to improve the pre-treatment accuracy of industrial saline wastewater. The authors claimed that their proposed model can control the dissolve oxygen (DO) and nitrate nitrogen in saline sewage treatment plant, based on recursive fuzzy neural network.

The next paper entitled, "*Research and Analysis of Intelligent English Learning System Based on Improved Neural Network*" by Meng Yin, proposed an intelligent English learning system based on improved neural network by considering the factors of the intelligent English learning. The author used the wavelet neural network to correct the network parameters and affine transformation to design the connection between the wavelet transform and the network coefficients for the English learning system.

Zhang Haiyan et al. in their paper entitled, "*Application of SVGA Video Real-time Transmission Technology in Music Education Information Communication*", designed a model to use a 100-megabit wired network cable or wireless channel as a physical transmission medium to extend the HDMI interface in order to solve the problem of clarity and real-time in the video transmission of music education information. The authors used FPGA video image acquisition and processing system as the platform to realize, and simulate video acquisition, transformation, storage, display and transmission.

Jierong Wu and Baodi Chen in their paper entitled, "*English Vocabulary Online Teaching based on Machine Learning Recognition and Target Visual Detection*", proposed English vocabulary detection model based on convolutional neural network by combining English vocabulary recognition needs of online education to improve the English vocabulary recognition effect. The model has considered the overall feature of word such as directional, angular, loop, and additional stroke features of the word as the feature extraction principle and adopted the analysis and extraction of the joint segment feature.

The next paper entitled, "*Text Recognition and Classification of English Teaching Content Based on SVM*" by Huiyan Li, designed a text recognition model based on convolutional neural network to improve the future English teaching. The author has used Baidu's data set for training set and verification set to train various network structures and to verify the loss to determine the performance of the model.

Xianju Fei and Guozhong Tian in their paper entitled, "*Attendance Automatic Recognition and Learning Behavior of Web-based Course Attendance Based on Machine Learning Algorithms*", proposed a method based on ASM and GWT for precise location of 2D and 3D face feature points using two steps i.e. coarse positioning and precise positioning. The ASM algorithm was used to extract facial features, and Gabor-wavelet packet set and Gabor beamlet were used to set for auxiliary recognition, which improves the recognition rate.

The next paper entitled, "*Multimedia English Teaching Analysis Based on Deep Learning Speech Enhancement Algorithm and Robust Expression Positioning*" by Kelei Hao, proposed an intelligent network teaching system model based on deep learning speech enhancement and facial expression recognition to improve the efficiency of multimedia English teaching by considering the feature like lack of emotion in multimedia English education. The author has used emotional calculation as the theoretical basis and facial expression recognition as the core technology to judge and understand the emotional state by capturing and recognizing the facial expressions of online learners.

Leng Jing et al. in their paper entitled, "*Network Education Platform in Flipped Classroom Based on Improved Cloud Computing and Support Vector Machine*", designed a student state recognition model by combining Support Vector Machine with Cloud Computing platform to estimate the student's learning state at any given time. They claimed that their model can detect the student's line of sight change from their facial image obtained from the camera and can classify different line of sight changes from different eye movement patterns.

The next paper entitled, "*Innovation of English Teaching Model Based on Machine Learning Neural Network and Image Super Resolution*" by Fan Zhang, designed a classroom behaviour recognition system based on machine learning and image super-resolution to predict the current English teaching status. The author has combined video technology and pattern recognition technology to simplify the process of data collection and analysis with high accuracy.

The next paper entitled, "*Performance Appraisal of Business Administration Based on Artificial Intelligence and Convolutional Neural Network*" by Xin Gui, designed a sound performance appraisal system based on artificial intelligence with convolutional neural networks to improve business management performance as performance appraisal in business administration. The author claimed that the model focused on the customer dimension, the financial dimension and consistent with its goal of preventing risks and re-innovation.

The next paper entitled, "*Application of Machine Learning and Cloud Computing in Social Media Behavior Analysis*" by Na Yuan, proposed a microblog recommendation algorithm based on statistical features such as computational science, statistical physics, probability theory, optimization theory and communication and complex network to analyze the Weibo behaviour through machine learning and cloud computing technology. The author has claimed that the algorithm has simple structure and strong computing performance and performs feature data mining through cloud computing big data method, which was suitable for online mining microblog behaviour.

Xiaoxu Guan et al. in their paper entitled, "*Construction of Science and Technology Achievement Transfer and Transformation Platform Based on Deep Learning and Data Mining Technology*", designed a technology transfer platform through deep learning combined with data mining technology to eliminate the influence of adverse influence factors into productivity of enterprises. The authors also proposed countermeasures and suggestions for solving the problem of the transformation of scientific and technological achievements of enterprises.

The next paper entitled, "*Analysis of English Teaching Based on Convolutional Neural Network and Improved Random Forest Algorithm*", by Huifang Cao, proposed a static image human body behaviour recognition method based on Convolutional Neural Network and improved random forest by considering the similarities between different behaviour classes. The author has used word bag model-based classification method to identify the human body behaviour of static images under different image representation conditions, and analysed the background information of the image and the spatial distribution information of the image features for the recognition accuracy.

Nianli Xu and Fengying Liu in their paper entitled, "*Application of Image Content Feature Retrieval Based on Deep Learning in Sports Public Industry*", designed an effective detection algorithm based on deep learning to analyse the image content retrieval in the sports industry and to promote the application of image content retrieval in the sports industry. The authors claimed that the method can effectively reduce the size of the candidate set of query results without affecting the accuracy of the query.

The next paper entitled, "*Development of Computer Aided Classroom Teaching System Based on Machine Learning Prediction and Artificial Intelligence KNN Algorithm*", by Yu Quan, designed a model based on machine learning prediction and KNN algorithm for class room teaching. The author claimed that the model can collect video and images for student behaviour recognition, and can distinguish individual students from a group.

Pengpeng Li and Shuai Jiang in their paper entitled, "*Analysis of the Characteristics of English Part of Speech Based on Unsupervised Machine Learning and Image Recognition Model*", proposed an English character recognition method based on unsupervised machine learning and image recognition technique to identify multi-body rotating characters. The authors claimed that the model computed a covariance matrix from the multi-body rotation characters and constructs a feature subspace using a covariance matrix. This method utilized the principle of the periodic characteristics of the trajectory rotation on the feature space.

The next paper entitled, "*Analysis of Task Degree of English Learning Based on Deep Learning Framework and Image Target Recognition*", by Jing Yu, designed a shallow convolutional neural network based on the Tensor Flow architecture for identifying images and uses GPU training acceleration to solve the problem of time complexity of the large facial database. The author claimed that their method combined image recognition technology with Deep learning to analyse the learning task of English, and explored the method of recognizing the learning state of students.

Wentie WU and Shengchao XU in their paper entitled, "*Application of MapReduce Parallel Association Mining on IDS in Cloud Computing Environment*", designed an association rule mining algorithm based on MapReduce parallel computing framework to parallelize and to improve the mining of frequent item sets. In this paper the parallel apriori was designed to run on Intrusion-detection system (IDS) for an open source cloud computing framework in Hadoop cluster.

Ningning Yang et al. in their paper entitled, "*Recognize Basic Emotional Statesin Speech by Machine Learning Techniques using Mel-Frequency Cepstral Coefficient Features*", proposed a suitable algorithm considering performance verses complexity for deployment in smart home devices to analyse emotional states in speech. In this paper, the authors used BPNN, ELM, PNN and SVM as classifiers to identify the four emotions of happiness, anger, sadness and neutrality from the EMO-DB database to analyse the expression effect of MFCC features on speech emotion.

Section-IV: Ambiguity

The first paper entitled, "*Scale design of opinion leaders' impact on online consumers' purchasing intention*", by Fei Menga and Jianliang Weib, designed the questionnaire for opinion leaders to analyse the impact on online purchase intention. The authors measured the characteristics of opinion leader, the characteristics of opinion leader's recommendation information and the influence of consumers' characteristics on purchase intention to analyse the impact on purchasing behaviour of consumers.

Qinge Wang and Huihua Chen in their paper entitled, "*Optimization of Parallel Random forest Algorithm based on Distance Weight*", proposed an optimization method based on distance weights for parallel random forest algorithm to overcome the problems of long execution time and low parallelism of existing parallel random forest algorithms. They have proposed the concept of distance weights to optimize the algorithm. The authors claimed that the random forest algorithm based on distance weight optimization has fast execution speed that can better meet the requirements of operation, and has high practicability.

The next paper entitled, "*Optimization of Architectural Art Teaching Model Based on Naive Bayesian Classification Algorithm and Fuzzy Model*", by Ying Liu, proposed a new hybrid architectural art teaching model by combining the naive Bayesian classification algorithm with the fuzzy model and validated their model in teaching practice. The author has claimed that, by combining the fuzzy model with the naive Bayesian classification algorithm, the materials needed for architectural art teaching can be quickly generated.

I want to express my sincere thanks to all the reviewers for their timely support and critical suggestions during the review of these papers. Lastly but not the least, I want to express sincere thanks to all the contributing authors without which this special issue could not have possible. I am sure that the reader shall gain immense academic inputs from this special issue.

Srikanta Patnaik
Guest Editor