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## **A Research Review of Machine Learning Algorithms**

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**Abstract** - This article analyzes the basic breakdown of machine learning, which includes supervised reading, supervised reading, and reinforcement reading. This Includes analysis of common algorithms in machine learning, such as tree decision algorithm, random forest algorithm, artificial neural network algorithm, SVM algorithm, Boosting and Bagging algorithm, BP algorithm etc. Through the development of theoretical systems, the continuous development of independent reading skills, the integration of more digital technologies, and the promotion of customized personalized services, the aim is to improve people's awareness of machine learning and accelerate the speed of machine learning.

**Keywords** - Machine learning, Random forest algorithm, Artificial neural network algorithm, SVM algorithm. etc.

### **I. Introduction**

With the rapid development of science and technology, artificial intelligence has also introduced new opportunities for development. Computer technology is based on computer technology incorporates knowledge of multi-disciplinary knowledge, such as mathematics and algorithm complexity, which further strengthens the operational aspects of artificial intelligence. By performing a rational analysis of machine learning algorithms, it can provide a reference for subsequent machine learning development, thus improving the performance of machine learning algorithms and providing additional comfort for the economic development of the sector.

## **II. Basic Classification of Machine Learning**

### **2.1. Supervised Learning**

In a machine learning process, supervised learning is a basic learning process. This approach to learning refers to the development of interactive learning strategies by people prior to learning. During initial machine training, the machine relies on information technology to learn learning requirements. In order to collect basic data, we must gradually complete the required content to be read in a supervised environment. Compared with other learning methods, supervised reading can fully stimulate the typical learning ability of the machine itself. After completing the system study, it can help people to solve certain divisive or reversible problems, which is very systematic. Currently, the most commonly used traditional learning methods include BN, SVN, KNN, etc. Because every learning process is purposeful, the machine learning process introduces some familiarity, and the learning content is very organized.

### **2.2. Unsupervised Learning**

Related to supervised learning; unread. The so-called unregulated reading means that the machine does not mark the content in a particular direction during the entire learning process, but relies on the machine itself to complete the data analysis. In essence, the process is to allow the machine to learn basic concepts and content, and then give the machine enough freedom to complete a series of content readings, which include concepts and content similar to basic principles, such as tree roots. In general, the continuous development of phased reading has increased the scope of machine learning content. Currently, unregulated learning includes algorithms such as deep belief networks and autoencoders. Such situations are associated with the solution of integration problems and have good applications for the development of many industries.

### **2.3. Reinforcement Learning**

In addition to supervised learning and supervised learning, there are also effective ways to enhance machine learning. The so-called reinforcement learning is systematic reading of specific content. In a particular application process, data collected in the past will be used. Organizes and analyzes part-time response data to create a closed loop of data processing. Overall, reinforcement learning is a form of learning that enhances data collection based on mathematical and dynamic learning. Such methods are especially used to solve robotic control problems. Its independent learning methods include a Q-learning algorithm and a time difference learning algorithm.

## **III. Analysis of Commonly Used Algorithms for Machine Learn**

### **3.1. Decision Tree Algorithm**

Among the algorithms most commonly used in machine learning, the decision tree algorithm belongs to the content of the classic algorithm. Its principle is that when processing data, it starts at the root node of the collection sample and reaches the point where the nodes meet to make it complete. It's a scientific classification of practical examples. To facilitate data analysis, the decision-making algorithm will continue to classify branches, and at the same time, branches will be cut to improve the integrity of the data content [3]. From a

computational point of view, the algorithm belongs to the top-down algorithm. During the content analysis process, node content is analyzed to find the appropriate attributes, and the node expands to more than two based on node. In this way, you can get complete information for classification data, and the compounding method as a tree can also increase the number of samples that can be analyzed, and at the same time determine the content that contains the most samples per category according to the sample number statistics. For example, when analyzing data, you can name a decision tree with a large amount of data information as the main tree A, and set the upper limit for branch division. If the upper limit is set at 5, the main tree A is in phase after reaching the 5th point, it will cease to continue dividing, and at the same time use the pruning strategy to process the large tree model, to refine the data and improve the science of data analysis results.

### **3.2. Random Forest Algorithm**

Similar to the decision tree algorithm, in the data calculation process, a random forest algorithm can be used for further processing. The random forest algorithm will play a positive role in controlling random data in the actual use process. Thus it effectively develops the science of data classification results and the accuracy of data analysis results. At the same time, in the data analysis system, multiple sets of partition trees will be created at the same time, and an integrated algorithm will be used to process the retrospective. Assuming the decision tree is a set representing  $a_i$  ( $i = 1, 2, 3 \dots n$ ), then the random forest is the sum of set A, where  $A = \{a_1, a_2, a_3, \dots, a_n\}$ , where  $a = 1, 2, 3 \dots n$ . Each set remains independent, and distribution is a random distribution mode. When checking the details of the split data, it will be selected by voting method. Dividing by the highest number of votes in a vote will result in a vector  $x_i$  value, and the vector content will be divided to calculate the average number of regions for different points and provide the reference data for the final decision.

### **3.3. Artificial Neural Network Algorithm**

A network called an artificial neural network refers to the simulation of a person's information system transmission, splitting different data into a single neuron, and connecting data neurons with assistance online to accomplish complex memory tasks. However, an artificial neural network algorithm is based on this ongoing data analysis process. Among the separated neurons, each digital unit has a high level of authenticity, and data can complete the external logging process. It's just like the human body moves forward, stops, and runs. In the neural network algorithm, data the information presented has various aspects of the application, as well as related analysis the process can be completed according to real needs. Currently, synthetic neural is commonly used networks including pre-multilayer MLFN neural networks, autonomous neural networks, SOM, and ART [5]. For ease of data analysis and calculation, we can set the rating pre-coefficient and set the output limit. After the calculated amount exceeds this number, a certain number is an outward result, thus improving the order of the whole number analysis process.

### **3.4. SVM Algorithm**

In the machine learning process, the SVM algorithm also belongs to the commonly used algorithm content. In a particular application process, the algorithm relies heavily on the vector machine method to complete the prescribed data analysis task. At the same time, the SVM algorithm will use SVM automatic support for data analysis to be processed, for improvement data information. To improve the science of the final results of data analysis,

actually analysis process, many sets of analysis samples need to be collected in order to determine the sample data for boundary value. For example, it is assumed that the data information to be considered by H (d), to process it, first, the data information is processed locally with the help of SVM technology can be completely disbanded. Second, the boundary of flight H (d) is determined from the maximum distance of the entire aircraft. Finally, the contents of the H (d) aircraft vector are analyzed to find the output vector, which improves the accuracy of the data process. Boosting algorithm as a new type of machine algorithm, its main advantage of the application that it can complete accurate data processing and improve final accuracy to process the result. In fact, a work forecasting system will be developed with the help of Boosting algorithm, and system content will be continuously improved with the help of enhancement learning mode, thereby speeding up the processing of data information. AdaBoost is relatively basic application to the Boosting algorithm. At the same time, AdaBoost is also an important guarantee of Boosting algorithm extension. The Bagging algorithm has the highest similarity in data processing process. In the real app, the difference is that the Bagging algorithm selects randomly training set. And when calculating a work model, the Bagging algorithm does not analyze the weight of the content, and we need to continuously improve the data model with the help of training to improve the accuracy of data analysis results.

### **3.6. BP Algorithm**

The BP algorithm is for controlled reading. Contains a computer-assisted neural network model which, includes input layer, hidden layer, and output layer. A large number of neurons are connected to each other as network nodes. Each neuron processes network signals such as network weights with exciting activity. By adjusting this connection strength, pattern information contained in the input data is mapped to the output layer.

## **IV. Research on Machine Learning Development**

### **4.1. Theoretical System Continues to Mature**

In the future development process, the system of mechanical theory will also be further developed, and its own branches of content and integration will be expanded. In the first process of machine construction learning content, your content applies especially to other changing industries, as well as the content of the whole theoretical system is not fully understood. In practical terms, its content the theory system does not work in some fields. In response to such situations, the next section of machine learning theory will be further enhanced, as well as the level of refinement of content will also be strengthened, providing easy conditions for the next promotion machine learning.

### **4.2. Autonomous Learning Ability is Further Improved**

Currently, many Chinese businesses recognize the automation development model, too ingenuity is the focus of the next phase of development. In the case of rapid development of Internet technology, the independent reading ability of machines will be further enhanced. Whether it is supervised reading or supervised reading, independent you can learn by machine master will continue to increase. In the future of machine learning, the machine will do perform targeted or comprehensive learning according to its needs, which reduces the economy business costs to renovate machine building, thus forming a solid foundation for the stable business economic development.

### 4.3. Integration of Multiple Digital Technologies

At this point, reliance on Internet technology has produced many branch technologies, such as the Internet Material technology, digital technology, cloud computing technology, etc. This technology can provide many convenient conditions for the data calculation process. Although these are digital technology is in the early stages of integration, with the rapid development of technology, digital integration is also constantly evolving. Otherwise, in future development process, this technology will be integrated with algorithms to create a new technology application the system, thus laying the foundation for continuous improvement of data analysis speed.

### 4.4. Promotion of Personalized Customization Services

With the continuous development of socio-economic status, human needs for personalization applications are also growing, which is also one of the most important means of development of future machine learning. With the continuous development of intelligent technology learning, different application modules can be set according to the real needs of users. After to receive a user request message, the data module can filter the corresponding information content and align with the corresponding service content at the same time to meet the user's needs requires and improves user satisfaction.

## V. Conclusion

In short, machine learning is still young, and very dependent on supervised learning, too it does not fully overcome weak artificial intelligence. Qualified employees need constant improvement thereafter foundation and machine learning functionality. In the corresponding field of science as well the development of computer technology, we must provide a good environment for machine learning, and the prospect of machine learning development is very broad. In addition, it is also necessary diligently learn from the experiences and lessons of the developed world, set up machine algorithms is conducive to the development of local businesses, and provides economic technical support industry development.

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