Assignment

Research on Machine Learning and Its Algorithms and Development

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1 Introduction

With the rapid development of science and technology, artificial intelligence has also ushered in new development opportunities. Machine technology based on computer technology incorporates multidisciplinary theoretical knowledge, such as statistics and algorithm complexity, which further strengthens the functional attributes of artificial intelligence. By doing a reasonable analysis of machine learning algorithms, it can provide direction reference for subsequent machine learning development, thereby improving the applicability of machine learning algorithms and providing more convenience for the economic development of the industry.

2 Basic Classification of Machine Learning

2.1. Supervised Learning In the process of machine learning, supervised learning belongs to a relatively basic learning method. This learning method refers to the establishment of corresponding learning goals by people before learning. During the initial training of the machine, the machine relies on information technology to learn the needs of learning. In order to collect basic data information, we are supposed to gradually complete the required learning content in a supervised environment. Compared with other learning methods, supervised learning can fully stimulate the generalized learning potential of the machine itself. After completing the system learning, it can help people to solve some classification or regression problems, which is highly systematic. Currently, the classic learning methods commonly used include BN, SVN, KNN, etc. Because the entire learning process has purpose, the machine learning process presents a certain regularity, and the learning content is more systematic [1].

2.2. Unsupervised Learning Corresponding to supervised learning is unsupervised learning. The so-called unsupervised learning means that the machine does not mark the content in a certain direction during the entire learning process, but rely on the machine itself to complete the analysis of data information. In practice, the operation method is to let the machine learn the basic concepts and content, and then give the machine enough freedom to complete a series

of content learning, including concepts and content similar to the basic principles, such as tree roots. In general, the continuous improvement of learning in stages has increased the breadth of machine learning content. At present, unsupervised learning includes algorithms such as deep belief networks and autoencoders. Such situations are conducive to the solution of clustering problems and have good applications in the development of many industries [2].

2.3. Reinforcement Learning In addition to supervised learning and unsupervised learning, there are also application methods of reinforcement learning in machine learning. The so-called reinforcement learning is the systematic learning of a certain content. In the specific application process, the data collected in the previous period will be used. It organizes and processes the feedback information of a certain part to form a closed loop of data processing. On the whole, reinforcement learning is a type of learning method that expands data collection based on statistics and dynamic learning. Such methods are mainly used to solve the control problem of robots. Its representative learning methods include Q-learning algorithm and Temporal difference learning algorithm

3 Analysis of Commonly Used Algorithms for Machine Learning

3.1. Decision Tree Algorithm Among the commonly used algorithms for machine learning, the decision tree algorithm belongs to the classic algorithm content. Its working principle is that when processing data information, it starts from the root node of the collection instance and reaches the position where the nodes meet to make it complete. Scientific division of practical examples. In order to facilitate the analysis of data information, the decision number algorithm will continue to split branches, and at the same time, the branches will be trimmed to improve the integrity of the data content [3]. From the point of view of calculation, the algorithm belongs to the top-down algorithm. During the content analysis process, the content of the node is analyzed for the optimal attributes, and then the node is expanded to more than two based on the node. This way, you can get comprehensive data information of the split, and the branching method like 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 in the classification according to the sample number statistics. For example, when analyzing data, you can name the decision tree with a large amount of data information as the larger tree A, and set the upper limit of branch splitting. If the upper limit is set to 5, the larger tree A is in the classification after reaching the value of 5, it will stop continuing to split, and at the same time use the pruning strategy to process the larger tree model, so as to refine the data and improve the scientificity of the data analysis results.
3.2. Random Forest Algorithm Similar to the decision tree algorithm, in the process of data calculation, the random forest algorithm can be used for further processing. The random forest algorithm will play a good role in controlling

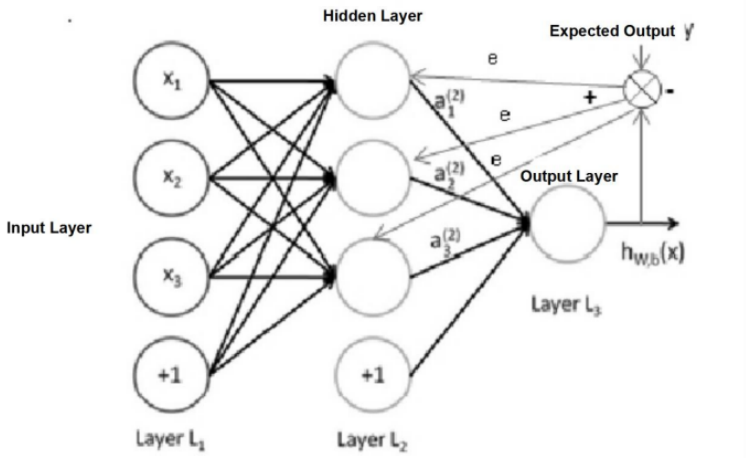

Figure 1: **Basic Principles of Algorithm Application**

unreasonable data in the process of actual use. Thereby effectively improving the scientificity of the data split results and the accuracy of the data analysis results. At the same time, in the process of data analysis, multiple sets of classification trees will be created at the same time, and then the unified algorithm will be used for regression processing. Assuming the decision tree is an independent set ai (i = 1,2,3 ... n), then the random forest is the total set A, where A = a1, a2, a3, ..., an, where a = 1,2,3 ... n. Each set remains independent, and the distribution is a state of random distribution. When evaluating the classification data information, it will be selected by means of voting. The classification with the highest number of votes in the voting will output the vector value xi, and then the vector content will be classified to calculate the average value of different score states and provide data reference for the final judgment [4].

4 Equation:

$$y = \sum_{n} x_n^2 \tag{1}$$

5 Research on Machine Learning Development

4.1. Theoretical System Continues to Mature In the future development process, the mechanical theory system will also be further optimized, and its content branches and coverage will also be expanded. In the initial formulation process of machine learning content, its content is mainly applicable to some automation industries, and the content of the entire theoretical system has not been

Algorithm	Best Case	Expected
Selection Sort	0(n2)	0(n2)
Merge Sort	0(NlogN)	0(NlogN)
Linerar Search	0(1)	0(N)

Table 1: Example Table.

completely sound. In practical application, the content of its theoretical system is not applicable in some fields. In response to such situations, the next stage of machine learning theory will be continuously strengthened, and the degree of refinement of the content will also be strengthened, which provides convenient conditions for the subsequent promotion of machine learning.

6 Conclusion

In summary, machine learning is still in its infancy, and it mainly relies on supervised learning, and does not fully overcome weak artificial intelligence. Relevant personnel need to constantly improve the theoretical foundation and practice of machine learning. In the corresponding scientific field and the development of computer technology, we should provide a good environment for machine learning, and the development prospect of machine learning is very broad. In addition, it is also necessary to actively learn from the experiences and lessons of developed countries, set up machine algorithms suitable for the development of domestic enterprises, and provide technical support for the economic development of the industry.