How to apply machine learning algorithms in artificial intelligence

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Abstract. Machine learning as the basic component of artificial intelligence, in the rapid development of network and computer technology has put forward a number of research topics, a variety of theoretical basis and practical application layer out of endless, which not only changes people's traditional production and life mode, but also provides technical support for the new era of urban construction and development. Therefore, after understanding the basic concepts and development stages of artificial intelligence and machine learning algorithms, this paper mainly explores the research content of machine learning proposed based on artificial intelligence, and master the concepts and application directions of different machine learning algorithms, so as to provide effective basis for theoretical and technological research in the field of artificial intelligence in the new era.

Keywords: artificial intelligence; Machine learning; Feedback evaluation; Supervised learning; Reinforcement learning.

1. Introducion

As an important branch of computer science research, artificial intelligence is mainly used to simulate the thinking process, learning ability and knowledge storage of human beings. After building intelligent entities, the instantiation will be regarded as a software program. This technology concept was put forward as early as the middle of the 20th century. It has a great impact on human life and production activities. It is not only a unique scientific skill, but also a research science containing multiple knowledge, whose purpose is to let computers have the same thinking ability as humans. Active learning is the core content in the field of artificial intelligence research. Power refers to the ability of models to express different relationships between variables. Deep neural network lines have proved to be very powerful models for acquiring complex information in data learning relationships. According to the accumulated research experience of domestic and foreign scholars in recent years, machine learning can improve the ability of machine in problem analysis, problem prediction, problem solving and other aspects, effectively improve the comprehensive level of mechanical learning, and can acquire new knowledge and skills in the process of mechanical operation. Therefore, it is the core topic of current research field. At the same time, the research on machine learning has spawned many branches, such as data mining, speech recognition, deep learning and so on. Under the development trend of economic globalization, with the continuous improvement of network information technology, information data presents an explosive growth trend, which is both an opportunity and a challenge for modern information processing technology. Machine learning algorithm is used to deal with the massive information data brought by the network at present, and has achieved excellent results in practical research.[1-3]

From the cumulative experience of machine learning algorithm research, there are three stages: first, the initial stage. In the middle of the last century, when machine learning algorithms were in their infancy, people mainly used programming to give machines the ability to think, so that machines could use the thinking ability to realize self-learning and self-evolution. In this process, various logic programs and solving programs need to be edited for the machine. However, the research results obtained at that time did not give the machine intelligence, but laid the foundation for the subsequent research on machine learning. Secondly, the development stage. This stage refers to the period from 1970s to 1980s when expert system brought machine learning into a new stage of development, but a large number of knowledge dilemmas also emerged. In order to effectively

solve this problem, some scholars put forward the idea of letting machines learn by themselves. Autonomous learning of machines was proposed and studied in the 1950s, and more learning technologies were available in the 1960s. In the early 1980s, the world's top experts jointly published Machine Learning: A Kind of Artificial Intelligence, which gathers 16 valuable research achievements on machine learning, and provides an effective basis for the application of machine learning algorithms in the new era. And finally, the boom phase. Since the 1980s, machine learning, as an independent subject theory, began to reform and innovate in the direction of diversification as it was integrated with other theoretical knowledge. With the continuous improvement of machine learning theory and technology, people have more and more understanding of this content and have made a clear division of it. For example, observation and discovery learning, instance learning, etc. are important branches of machine learning and have unique advantages in processing all kinds of data information. Therefore, after understanding the basic concepts of machine learning, this paper mainly explores the research direction of machine learning centered on the field of artificial intelligence. Then, starting from the perspective of existing machine learning algorithms, it mainly explores the two forms of supervision as a learning method and reinforcement as a learning method, so as to provide effective basis for the theoretical research of artificial intelligence technology in the new era.[4-6]

2. Method

2.1 Machine learning algorithm

In essence, machine learning, as a multidisciplinary discipline, includes statistics, probability theory, algorithm complexity theory and other disciplines. It mainly studies how computers simulate or realize human learning behavior, and finally acquire brand-new knowledge or skills, reorganize existing knowledge structure, and make them constantly improve their own performance. As an important field of innovation and development in the current industry, machine learning is commonly used in the following algorithms:

First, linear regression. Linear regression is one of the most common machine learning algorithms. It tries to fit the data points in the scatter plot on the basis of finding straight lines. Linear regression mainly uses linear equation and data fitting to represent the independent variable (x) and numerical result (y), and finally predicts the future value based on the straight line. From the perspective of practical research, the most commonly used technique of linear regression algorithm is the least square method, which can accurately calculate the best fitting line and ensure the minimum vertical distance of all data points on the line, and the total distance is the sum of the squares of the vertical distances of all data points.[7-9]

Second, logistic regression. This algorithm is very similar to linear regression and is mainly used to output binary. For the final output and prediction, a nonlinear S-type function, called Logistic, will map the intermediate result to the result variable Y. The actual value range will be from 0 to 1, and these values can be interpreted as the probability of Y. Combined with the logistic regression graph shown in Figure 1 below, it can be seen that it can directly present the relationship between the study variables, so it is more suitable for processing classification tasks.[10-13]
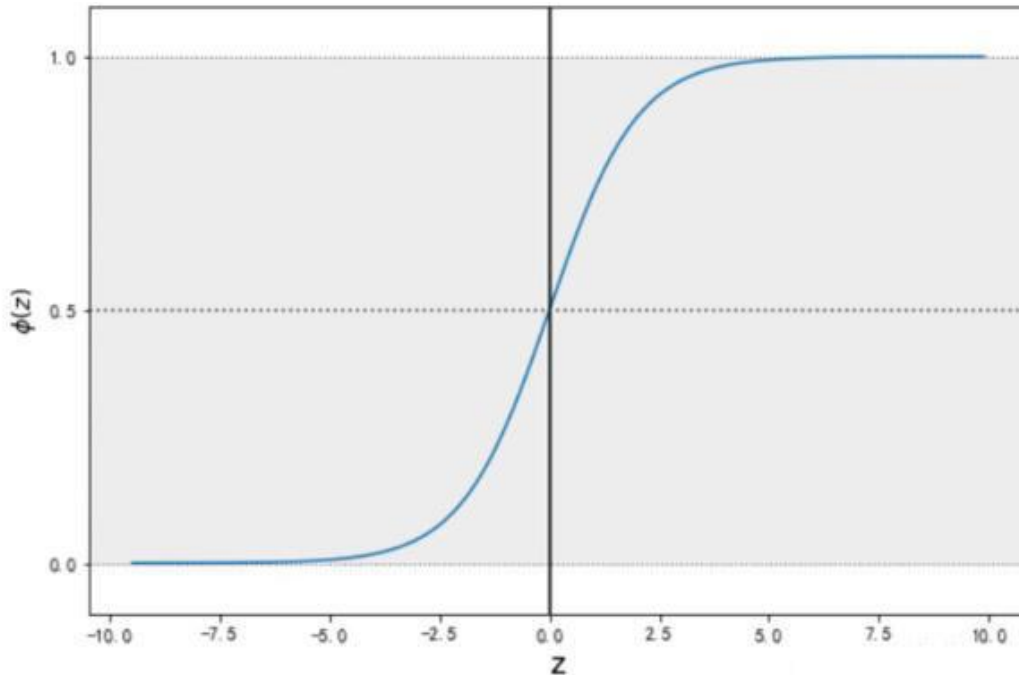
Figure 1 Logistic regression curve

Third, decision trees. The decision tree is mainly used to deal with regression and classification tasks. The training model can learn the value of the predicted target variable by learning the decision rules represented by numbers. The tree is composed of nodes with specific attributes, and each node can ask questions about the data according to the required features. Combined with the case analysis it can be seen that the importance of all features in the decision tree algorithm is determined from the top down. The higher the node, the more important the proof attribute.

Fourth, artificial neural network. Artificial neural network algorithm is mainly used to deal with large and complex machine learning tasks. It is essentially a set of interconnected layers composed of edges and nodes with weighted values, also known as neurons. Multiple hidden layers can be inserted between the input layer and the output layer, which helps the neural network algorithm focus on deep learning problems. Artificial neural network algorithms work in a way similar to the structure of the human brain, in which a group of neurons are assigned a random weight to determine how they process input data. Training neural networks to learn the relationship between input and output based on input data. In the training process, the system can access the correct answer, if the network cannot accurately identify the input, then the system will scientifically adjust the weight, after sufficient training is always correct recognition processing.[14-15]

Fifth, random forest. This algorithm is a very common integrated machine learning algorithm at present. In order to classify new targets, it can vote from the included decision tree, obtain the results, and finally draw a conclusion according to the majority vote. Combined with the random forest flow chart shown in Figure 2 below, it can be seen that, on the one hand, all decision trees in the training process are constituted based on the training set guide samples; In the sorting process, on the other hand, the decision to input instances is made by majority vote. Therefore, the specific steps are as follows:

Firstly, the number of samples and the number of characteristic attributes in the original training set were identified, and the bootstrap sampling technique was used to obtain multiple samples from the set and form a training subset. Secondly, multiple features are randomly selected from the feature attributes as candidate features, and the nodes of the decision tree are required to select the optimal attributes according to some rules for splitting, until all training cases of this node belong to the same node. Thirdly, the above two operations are repeated several times to generate a random forest. Finally, random forest is used for decision-making, and the category with the most votes is the final classification result.
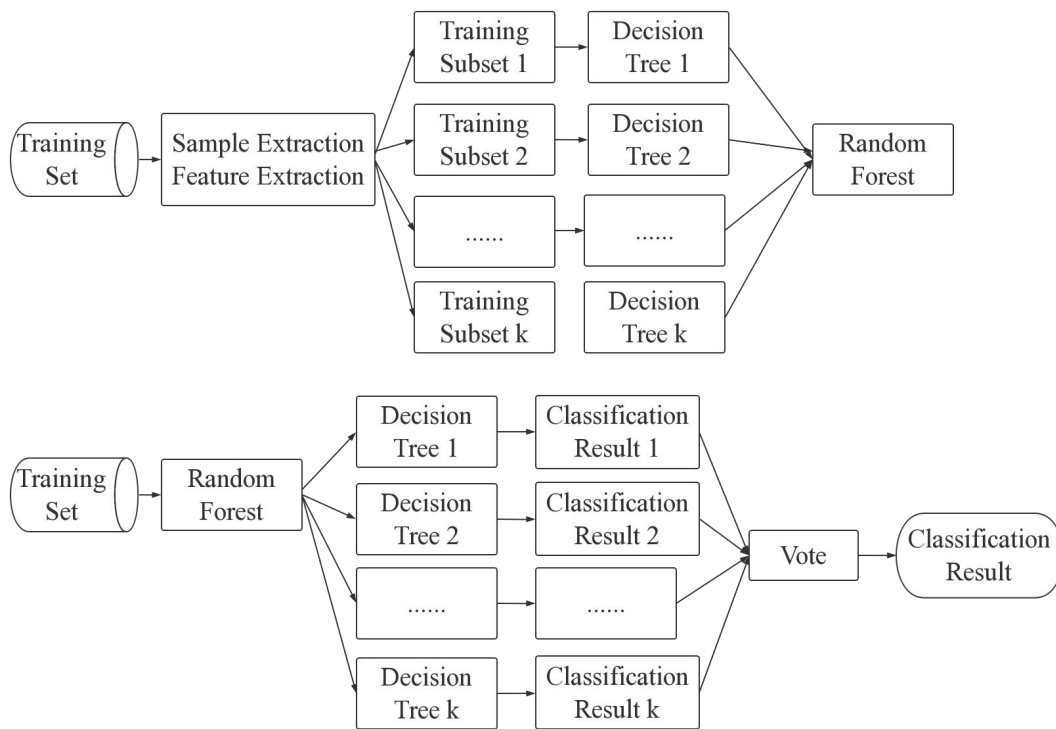
Figure 2 Flow chart of random forest

3. Result analysis

After identifying the machine learning algorithm proposed in the field of artificial intelligence, scholars in various fields have carried out researches on diversified arousal learning based on artificial intelligence technology, and paid attention to carrying out learning training from the perspective of environmental adaptability, continuously extending and expanding machine knowledge base, and creating machine learning feedback evaluation system, so as to provide effective basis for the development of artificial intelligence technology in the new era.

Firstly, machine learning is studied based on environmental adaptability. There are great differences between machine learning and human learning, among which environmental adaptability is very significant. Therefore, relevant research topics are the focus of the field of artificial intelligence. In order to ensure that machine learning algorithms achieve good results in application, researchers propose to create a suitable working environment to provide strong support for the operation of artificial intelligence systems. It should be noted that the environment is constantly changing, which not only has complex characteristics and variability, but also needs to master a large amount of data information as technical support, so as to fully implement the system action guidance in the field of artificial intelligence in the summary and promotion.

Second, continuously extend and expand the machine knowledge base. Machine knowledge base has different types and forms of expression, which is the concrete manifestation of effective implementation of machine learning, as shown in Figure 3below:
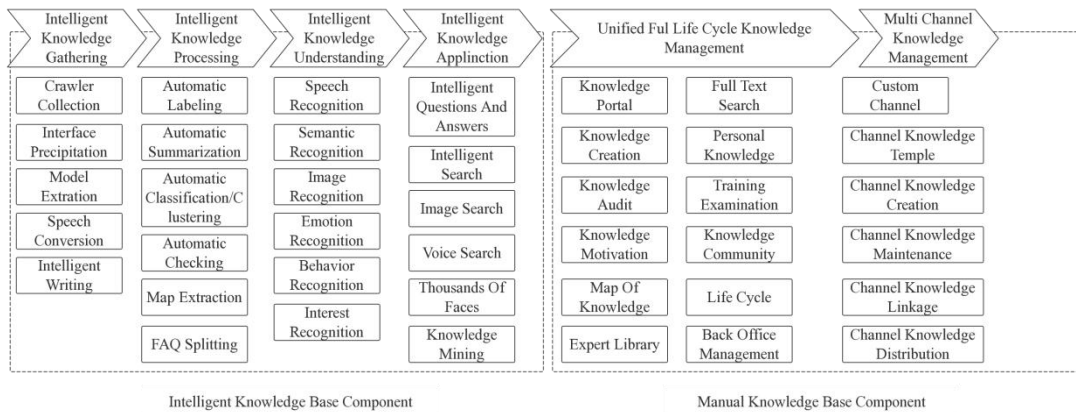
Figure 3 Architecture diagram of machine knowledge base

Based on the analysis of the figure above, it can be seen that the knowledge base contains multiple module functions, such as knowledge collection, knowledge processing, knowledge understanding, knowledge application, unified life cycle management, and multi-channel knowledge management. From the perspective of practical application, continuous expansion and extension of machine knowledge base can not only comprehensively improve the level of machine learning, but also truly achieve the expected work goals. Therefore, research scholars proposed in practice that we should attach importance to the construction of expression modes to ensure that the internal logic requirements are relatively simple, effectively control the calculation cost, and ensure that the module architecture is malleable.

Finally, create a machine learning feedback evaluation system. In the period of machine learning, the feedback evaluation system can be built to ensure that the final algorithm application effect is good. The implementation of feedback evaluation contains many contents, and the most critical is the basic feedback evaluation. At this time, the complexity is mainly reflected in the diversity of application concepts. When applying the strategy analysis evaluation system, a small evaluation system as shown in the following figure 4 should be established:
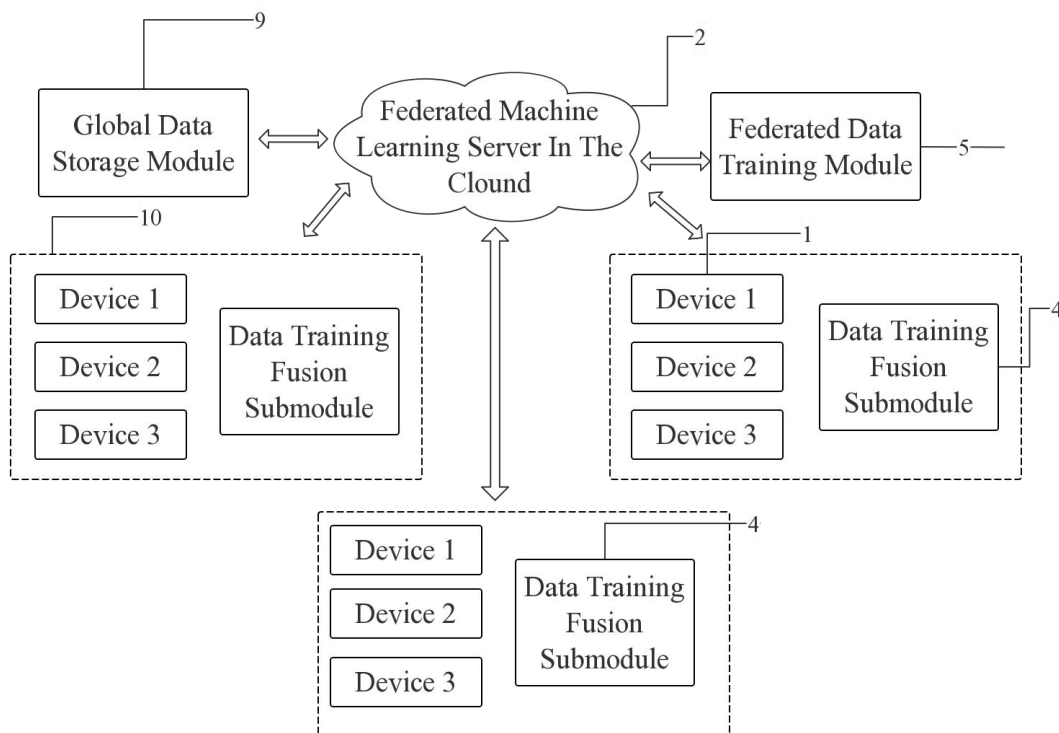

Figure 4   Architecture diagram of machine learning feedback evaluation

According to the analysis of the figure above, it mainly includes data training, training fusion, global data, storage and other modules. During the practical application, the actual situation should be fully considered, and the basic tasks should be gradually promoted after completion. At the same time, the feedback evaluation system should also ensure its high transparency, which is reflected in the implementation process and implementation results, etc. Only in this way can we ensure the authenticity and effectiveness of the data information finally obtained. From the current application situation of machine learning algorithm, common application methods can be divided into two kinds. On the one hand, supervised learning refers to the data input is training data, and the final result is very accurate. On the other hand, it refers to the reinforcement learning method. Input data will directly feed back to the model, so it needs to adjust the model in time.

4. Conclusion

In summary, according to the artificial intelligence technology and machine learning algorithm studied and mastered in this paper, in the rapid development of biological economy and science and technology, active learning is an important research direction in the era of artificial intelligence. Various fields should put forward a number of research topics according to their own development status, systematically master the machine learning algorithm, and identify the research results at different stages. Actively build a theoretical skill system with artificial intelligence as the core, give full play to the application value of machine learning algorithm, in order to promote the deepening of social economic reform, and comprehensively optimize the quality of life of social residents.

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