Network distributed information assets detection method based on Artificial Intelligence

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Abstract. Proposes a network distributed information assets detection method based on artificial intelligence. Through mining the characteristics of network distributed information assets, scanning information assets in depth, detecting assets, summarizing the characteristics of information assets, and optimizing the depth scanning mode of network information assets, the research goal of rapid and accurate detection of network distributed information assets is realized. The simulation results show that the proposed network distributed information assets detection method based on artificial intelligence has faster detection speed and higher detection accuracy, so as to meet the requirements of large-scale information detection and solve more complex problems.

1. Introduction
Aiming at the problem of poor detection effect of information assets, in order to solve the above problems, a method of network distributed information asset detection based on artificial intelligence is proposed. From the perspective of big data analysis of artificial intelligence information, this paper studies the multithreaded crawler technology in the technology of artificial intelligence information collection, and carries out the collection and mining of the characteristics of network distributed information assets, and scans and detects the IP, port, server and so on of the network distributed information assets detection and sets up the information processing protocol.

2. Network distributed information assets detection method

2.1. network distributed information asset mining
An Internet oriented information detection task management platform is designed. The owner of an information probe application can view the submitted asset information, as well as the asset information status, work status, project status, etc. The architecture of the network information detection task management platform is shown as Fig. 1.
The above platform structure mainly includes log recording, network communication, data transmission, heartbeat detection, etc. From the invasive low-speed LAN scanning to high-speed large-scale network scanning, the passive detection based on traffic analysis develops to the non-intrusion detection search based on query. A large number of data in artificial intelligence resources can be obtained in a variety of ways, the most common is to use web-crawler technology to obtain artificial intelligence information. Data preprocessing is one of the key links to ensure the quality of mining and utilization in the application of artificial intelligence. After the format is converted to format, it is stored according to the requirements of mining algorithm for subsequent mining. The basic development process is as follows:

2.2. In depth scanning of network information assets

Through the manual statistical technology, we can realize the regular query of the customer center server, and also can adopt the regular automatic report mode of the customer, so as to improve the work efficiency. In fact, there are many limitations to work[3]. For specific types of data source detection, there are three methods: active search engine and passive asset detection, as Fig.3 shown:
The fuzzy hierarchical energy consumption information corresponding to the number of network nodes is obtained. Determine the mapping relationship between the number of nodes and the dimension. Analysis of membership function. The fuzzy fitness of each node is obtained. The fitness values of fuzzy rules corresponding to each node in the perceptual layer are planned and processed. Calculating the output value of artificial intelligence neural network. Define the number of neurons in the hidden layer. Calculate the energy consumption control error of sensing layer nodes.

\[ e \leq \epsilon \]

Controllable

Uncontrollable

Figure.3  scanning process of AI information assets

At the transport layer, the behavior rules of artificial intelligence are formulated to make all artificial intelligence cooperate according to the specification. MAS is positioned in the artificial society, which imitates the characteristics of human society, and determines the activity sociality by designing the rules of activity state transition\[^4\]. Besides TCP and UDP, SCTP is the most widely used transport layer protocol in Lt\[^5\]. Transport address is defined by IP address, transport layer protocol type and transport layer port number. Endpoint is uniquely identified by IP + port number. Both x2ap diameter and s1ap support SCTP. Based on this, the security protocol of network information asset detection is constructed, as Fig.4 shown:

Figure.4  network information asset detection security protocol

Further deep traversal strategy, starting from the initial node, first access the first neighbor nod, and then access the first neighbor node in the form of the initial node\[^6\]. These useful pages can only be accessed through web page analysis rules. This defect is also obvious, because adding this filter rule will ignore many related pages. Therefore, this is only a local optimal search.
2.3. Realization of network distributed information assets detection

In order to facilitate the management, the assets census is carried out on a regular basis with the help of manual statistics and some software[7]. After completing an artificial intelligence project, users on the network can access the project through the browser[8]. The following are the specific steps:

![Network Information Assets Detection Principle](image)

By sending HTTP requests, such as IIS, Apache, and PHP, you can get the type of AI server. You can execute the appropriate probe and send a custom post request based on the server type, which contains the server software and the necessary environment configuration information. Then the request for obtaining information is sent to the server. The server gets the corresponding response information and obtains the required AI server parameters. In the future implementation, the configuration information of artificial intelligence application server will be used. On this basis, an optimized allocation scheme of electronic information resources is designed, which can realize the customization related functions of electronic information resources storage.

![Optimal Allocation Scheme of Resource Distribution](image)

First, we should select the host of NodeB with IP address of 10.0.0.2 and the IP address of local LAN node host is 192.168.1.2a. When sending initckhck from the client to the node to be detected, it is necessary to construct a dynamic parameter vtag, that is, provide a verification tag in the initial label field, and the value of this parameter should be between 1 and 4294967295. We can judge whether the identifier bit is 11. True indicates that cook ack response has been successfully received, four handshake mechanisms have been completed, and the detected node is an active node. According to this method, the packet request under ini is sent to the 3868 service port of the local eNodeB module, that is, the port other than Mini. After receiving the response from the initialization confirmation, the cookie echo block signal is sent. In order to achieve the research goal of rapid and accurate detection of massive distributed information assets.
3. Analysis of experimental results
The experimental simulation platform of Internet of things is constructed in matlab 7.0 environment, and
the artificial intelligence simulation platform is used for structural modeling and interactive modeling
to simulate complex real environment, which is helpful to solve complex problems. In order to ensure
the effect of experimental detection, the experimental parameters are set uniformly, as Table 1 shown:

| Parameter                            | Value       |
|--------------------------------------|-------------|
| Number of network nodes              | 50 nodes    |
| Monitoring scope                     | 100m×100m   |
| Initial energy                       | 10J         |
| Communication energy consumption     | 40bit       |
| Initial power                        | 0.40J       |
| Receiving power                      | 0.30J       |
| Multipath model magnification        | 0.010       |
| Controller protocol                  | MAC-SENSOR |
| Experiment time                      | 1000s       |
| Data packet                          | 550B        |
| Battery size                         | 25B         |

In order to test the efficiency and performance of asset information analysis, the test cases with batch
asset information data are used to test. The test results show that the time of asset information parsing
increases with the increase of asset information data. The performance test results of asset information
resolution are as Fig. 7 shown.

![Figure 7: Analysis of experimental results](image)

Based on the Fig. 7, the network distributed information asset detection method confirmed that it can
better improve the key link of system availability and solve the data volume under the current Internet
environment. In order to meet the needs of large-scale information detection, large data types and low
detection efficiency. This paper analyzes and designs the server side and the probe side respectively,
and studies the reliability and efficiency of the system.

4. Conclusion
This paper studies the traditional and new network asset detection methods, and summarizes the
advantages and disadvantages of various detection methods. This paper puts forward a method of
network distributed information assets detection based on artificial intelligence, and analyzes the key
technologies involved, so as to improve the research requirements for accurate detection of massive
information assets.

Reference
[1] Qi C, Fourie A, Chen Q, et al. (2018) A strength prediction model using artificial intelligence
for recycling waste things as cemented paste backfill[J]. Journal of Cleaner Production, 183:566-578.
[2] Zhang X, Wang Y, Liu C, et al. (2018) A novel approach of battery pack state of health
estimation using artificial intelligence optimization algorithm[J]. Journal of Power Sources, 376:191-199.
[3] Song H, Choi Y. (2018) Distributed multiple model extended information filter with unbiased mixing for satellite launch vehicle tracking[J]. International Journal of Distributed Sensor Networks, 14(4):15.

[4] Salehi H, Das S, Biswas S, et al. (2019) Data mining methodology employing artificial intelligence and a probabilistic approach for energy-efficient structural health monitoring with noisy and delayed signals[J]. Expert Systems with Applications, 135:259-272.

[5] Narasimha S, Kuri J, Sunny A. (2018) Reduced-complexity delay-efficient throughput-optimal distributed scheduling with heterogeneously delayed network-state information[J]. Performance Evaluation, 121-122:18-37.

[6] Bhagat S, Tran T M, Yaseen Z M. Development of artificial intelligence for modeling wastewater heavy metal removal: State of the art, application assessment and possible future research[J]. Journal of Cleaner Production, 2019, 250(4):119473.

[7] Mehdizadeh S, Fathian F, Safari M J S, et al. (2019) Comparative assessment of time series and artificial intelligence models to estimate monthly streamflow: A local and external data analysis approach[J]. Journal of Hydrology, 579(12):124225-124228.

[8] Yuan Z, Zhang X, Feng S. (2018) Hybrid data-driven outlier detection based on neighborhood information entropy and its developmental measures[J]. Expert Systems with Applications, 112:243-257.