The Data and Images of Natural Disaster News Report Based on Artificial Intelligence Technology Processing

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***Abstract*—In recent years, the technology of writing data news report by using artificial intelligence has been rapidly developed. The news that is generated automatically has strong timeliness. However, due to lack of humanistic care, it can't be widely used in long reports. Based on the collection and analysis ability on data of artificial intelligence, the data news can be completed by program algorithms and machine learning. By taking use of natural disaster data extracted by crawler, and achieving recognition and classification of disaster weather warning images by convoluted networks, this paper comes up with the model of data and images in the natural disaster news report based on artificial intelligence technology processing.**

Keywords—artificial intelligence, natural disaster, data, images

I. INTRODUCTION

A. Research Background

At 21:19 on August 8, 2017, a magnitude 7.0 earthquake occurred in Jiuzhaigou County, Aba Prefecture, Sichuan Province. Within 18 minutes after earthquake occurrence, the first news "a magnitude 7.0 earthquake occurred in Jiuzhaigou County, Aba Prefecture, Sichuan Province" was pushed by WeChat official account "China Seismological Network", of which the contents contained quick report parameters, epicenter topography, thermal population, historical earthquake, epicenter weather and others. This report was generated by computer taking 7 seconds to complete. Pan Huaiwen, the director of the China Earthquake Network Center, pointed out that "the robot enters into push platform, the spread speed would be fast and accurate, which can cover the major people within several seconds after the earthquake information report is completed" [1].

The cases of news report written by artificial intelligence have not been rare. The news generated automatically has strong competitive force in timeliness and accuracy, becoming the natural advantages of developing to write news report by artificial intelligence. However, currently, the artificial intelligence fails to play its role in long report due to lack of humanistic care and emotional intention, which are mainly applied for news alerts. At the same time, the acquisition and analysis ability on data of artificial intelligence coincides with the demand of data news. As a consequence, this paper would like to discuss the feasibility of artificial intelligence in the application to data news field, and bring up with the applicable model of data and images in natural disaster news report processed by artificial intelligence.

These authors contributed equally to this work

B. Journals Reviewed

According to a study by Guan et al. [2] at China University of Geosciences in 2021, it is shown that artificial intelligence has been focused on solving seismic data processing and comprehensive interpretation in the field of fluid deposit exploration. In addition, it has been widely used in automatic rock lithology and mineral classification, geological hazard risk assessment, intelligent interpretation of remote sensing images, natural seismic signal analysis and monitoring and prediction. And a variety of machine learning and intelligent computing methods have been able to meet the computing speed and prediction accuracy required by the large volume of seismic wave data, such as the combination of remote sensing image processing, neural network, genetic algorithm and swarm intelligence optimization algorithms to improve the image edge recognition accuracy.

In the article "AI and IoT in Atmospheric Sciences", it is shown that "three types of intelligent analysis can be achieved using the 'AI+IoT' model", namely real-time analysis, optimal analysis and predictive analysis. "Meteorological researchers are constantly trying to use this model for weather and climate prediction, weather disaster warning, etc. The application of this field is currently in its infancy, but in the future the integrated use of AI and IoT has great potential and development space in the field of meteorology." Currently, this technology is mainly applied in the fields of meteorological observation identification, meteorological data processing, and weather and climate analysis and forecasting [3].

According to Zhou's research [4], the current artificial intelligence method can realize the three-dimensional analysis and expression of pre-disaster warning, which provides a new technical method for pre-disaster warning, and "disaster management needs to capture real-time social media big data, and the development and application of specific crisis classification, entity classification and data aggregation technology is urge, and there is also a need to present and visualize social big data through maps", and "artificial intelligence has the characteristics of virtualization,

contextualization and science, which is one of the best technologies for post-disaster recovery" [4].

From the above literature, we can see that AI has played a great role in the research related to natural disasters, and the current technological development can fully support its academic research and application. It is undeniable that the data collection methods in the above research are worthy of our research in this subject.

However, these research topics still focus on climate prediction, pre disaster warning, etc., and do not visualize the data in news reports. Few studies have combined the two and conducted research on this subject.

The model in the above research is not applicable to news reporting. The two most obvious problems are:

- The images produced are too academic. The audience of news reports is far more than that of researchers engaged in natural disasters, so it is necessary to describe natural disasters in the most intuitive and concise words and images. High reading threshold will directly reduce the communication efficiency.
- The production process is too slow. The pursuit of timeliness in news reporting, which spends too much time on highly professional analysis, is not conducive to high-quality communication.

In conclusion, the author believes that in the field of natural disaster reporting, in order to facilitate understanding, ensure accuracy and improve output efficiency, AI needs to reduce professional analysis and use visual means of data visualization. "The information obtained by the audience will have a greater impact on the audience because of the preconception. The lack of information caused by delayed reporting or even concealment will leave room for rumors to spread. In serious cases, it will even make the media lose the ability to set the agenda, causing the spread of panic, reducing the credibility of the government, and causing secondary harm to the society" [5]. When major events such as natural disasters occur, news reports should not be silenced at the new media end, but should highlight the mobile priority strategy, and launch faster, more and better news reports and financial media works at the "two micro end" [6].

To solve the above problems, we choose to use the crawler algorithm to obtain public natural disaster related data.The natural advantage of open data is that it is less professional and easy to understand. Crawler algorithms can provide efficient data retrieval for data visualization, speed up the production of reports, and thus provide highly timely reports for the public.

II. Introduction of Data News

A. Multiplicity of Data Semantics

1) Data Storage

As it's shown in figure 1, data exists as a symbol, and symbol has its own semantics. Data can store ancient and past information, preserving the instantaneous moments that have been lost and helping us to track history. This is also the reason for data can be compared for time. Meanwhile, the characteristic of data can help innovation because innovation needs to focus on previous experience. For example, the record of data museum about historical dynasties can reflect this characteristic. In the natural disaster report, the storage of data can help media and the public to obtain past data so as to briefly summarize trends to form a collection.

2) Fragmentation of Data

The data is divided into different segments by structure. Each segment becomes the information carrier of different topics or views that empowering data diversity. Due to the fragmentation of data, it needs to guarantee the used data are convenient for communicating, solving and dealing with when using it. Meanwhile, when reporting natural disaster, this characteristic can enhance the logic of report and describe this disaster from multiple dimensions.

3) Abstractness of Data

Data is not the completed retention of the initial information. The public can't see or feel some information through data, instead they need to recover, process and use these scenarios through retained data by thinking. Data refines the essential characteristics from various matters of this event, and eliminates the non-essential characteristics. Just because of this feature, news report can extract concrete images from fact. As ancient documents recording, it is impossible to record all figures, all matters at all views, but to record their core and structure.

4) Granularity of Data

The granularity of data is similar to the pixels of pictures that countless of granules composing the data and carrying information. Meanwhile, the bigger of granularity is, the smaller the information carried by the data, and the easier the data to be understood. This characteristic of data is relevant with hierarchy of natural disaster reports. For example, in the same natural disaster event, some data only record the year of occurrence, but some data accurate all events into seconds.

B. Journalists' Subjectivity: Two Paradigms

At present, there are two main paradigms of data news report. Data driving news is that ones driven by data processing and discussed from multiple technical perspectives. "Data driving news is the tool to analyze and filter huge amounts of news data. It digs out news through integrating data." Data can drive media field to produce contents, such as judging whether movies are successful or not by scientific calculation. There are many risky factors in the data driving news, such as the different quality of data, the restriction of journalist's subjectivity, and the ignorance of relevance. The data are more emphasized in the data driving news, while the news is restricted. Data supports the narrative, but can't complete the narrative. Overemphasizing data will lead the increment of the narrative results, and the role of journalist editing will decrease.

The news report assisted by data has the feature of taking data as foundation and assistance. News is still the main body, of which the essence is "narrative drive" based on data analysis, and the data is just the means and methods of narrative assistance." Telling a good story is still the ultimate and fundamental demand of data news." "Journalists must be the managers of data." The CAR emerged in the early time (computer assisted reporting, investigation, reference and gathering talking) has been gradually replaced by data assisted news reporting along with the coming of ABC (AI, Big data,

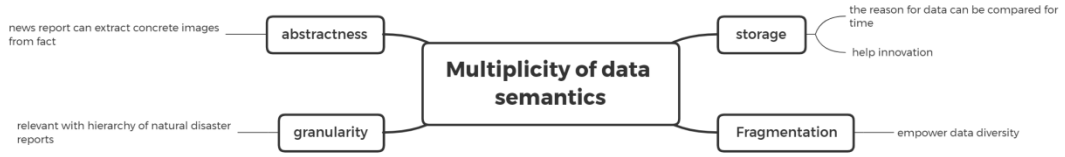

Fig. 1. Multiplicity of data semantics

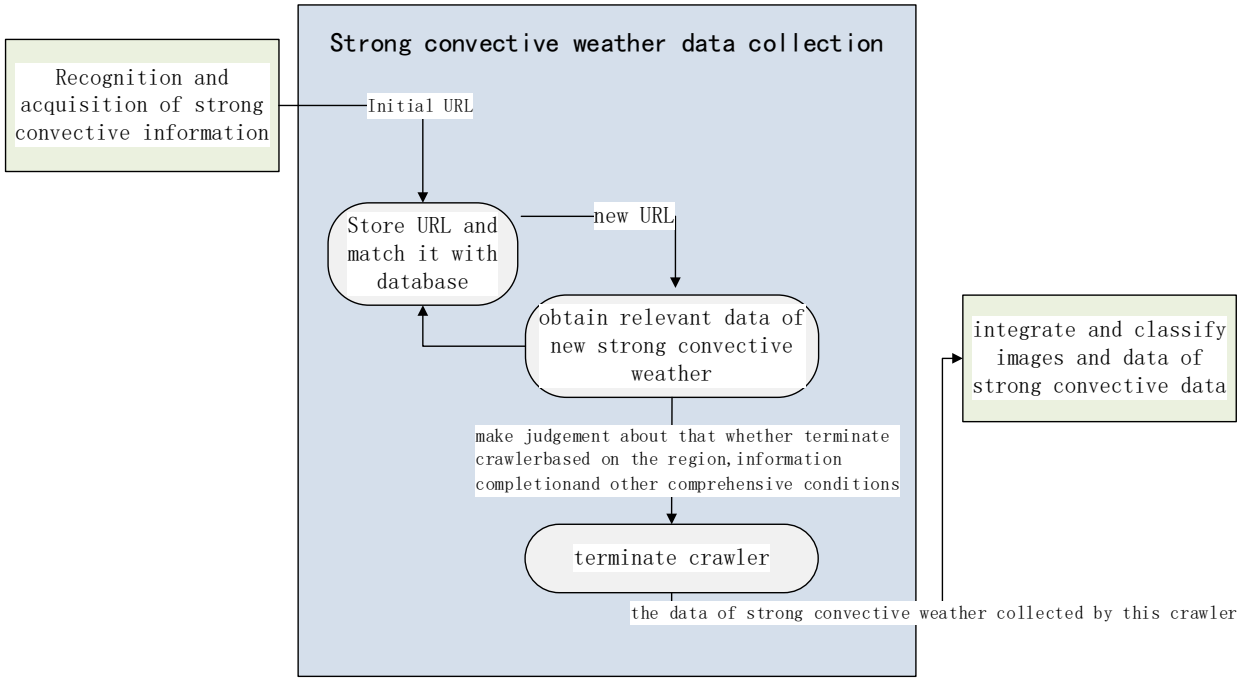

Fig. 2. The acquisition process of crawler's intelligent disaster data

cloud). To sum up, the main difference between two kinds of data news report paradigms is the driving force. The data driving news report is driven by data, while that of data assisted news report is driven by narrative. The priority of "data" and "news narrative" is different, which leading to more different points mentioned as above. Currently, due to journalists are still playing the main role in news reporting, the data assisted news report has a more common paradigm in application.

III. Application of Artificial Intelligence in Natural Disaster News Report Field

For natural disaster related data, there are two main parts, one is textual information data and the other is image data. One of the main features of textual information data is that it is relatively standardized relative to textual and professional data, such as strong convective weather and the corresponding level, dry weather and the level of drought degree. However, the relative types are more complicated. Taking weather disasters as an example, the typical ones are strong convection weather, morning fog weather, typhoon weather, drought weather, geological disaster weather, etc. The classification of each disaster weather level has its own characteristics. On the other hand, the image data is characterized by the fact that most of them have the map templates of sea and land boundaries, and the corresponding colors are used to distinguish different levels for different kinds of weather hazards.

Based on the analysis of the data characteristics related to natural disaster news, we also have a corresponding strategy in the relevant processing algorithm, as follows.

1) Crawler algorithm: Taking weather disasters as an example, most of the related warnings and real-time data come from professional public portals on the Internet. On the other hand, the corresponding professional names of weather disasters are more fixed and keyword retrieval is easier, so we can use crawler algorithm to obtain real-time and wide range of first-hand related data information.

Using crawler algorithm to obtain public natural disaster data has the following advantages:

- Improve the efficiency of natural disaster data retrieval: In the era of information explosion, data information is complex and highly timely. This is especially true of public data related to natural disasters. For example, when a typhoon occurs in a certain area, you can retrieve typhoon information on various portals, professional websites, social platforms, etc., but if you want to obtain accurate, open and authoritative target disaster data at the first time, it will undoubtedly bring huge workload. However, the use of the crawler algorithm will greatly reduce the labor cost, and can

more efficiently and accurately obtain the relevant data of the target natural disasters.

- Crawlers can make data acquisition more accurate：The data of natural disasters contain a lot of professional data and technical content. Many of the data content is often not the material required by the press release, so other professionals are required to conduct manual identification and screening. However, the quality of the news data that are subject to manual identification and screening is not uniform. After using the crawler, we can accurately screen the natural disaster data we need after formulating standard screening rules.

2) Convolutional neural network recognition and classification. Since natural disaster data will have many image data, such as typhoon path map and distribution map of strong convective weather, we can apply the convolutional neural network of typical image recognition to train the recognition of disaster data images, or take the strong convective weather in weather disaster as an example, on the one hand, we can identify the type of disaster by the title name in the image, and on the other hand, we can identify different levels of disaster by the training color.

Specifically, the convolution algorithm has the following advantages：

- Recognition of image data that can deal with natural disasters: We all know that convolutional neural networks are widely used in image recognition, speech recognition and other fields. For natural disasters, images are one of the most intuitive and critical data elements. Basically, the data description of each natural disaster can not be separated from images, so image recognition is an indispensable function of natural disaster identification.

- Can cope with the complexity of natural disaster images：The image elements related to natural disasters are complex and professional. Sea land boundary, administrative region division, etc. are the basic elements to describe the geographic information of natural disasters. Different colors represent the severity of natural disasters. Complex geographic information will have the superposition of longitude and latitude information. The convolution algorithm has been developed and applied in image recognition and processing, so the application of convolution algorithm can be more conducive to the recognition and analysis of weather data of natural disaster images.

A. The Key Points and Processes of Crawler Technology Related to Disaster Weather News Data

Taking the strong convective weather as an example, shown as figure 2, the collection process of strong convective weather news data based on Internet crawler is as below:

1) Retrieve the strong convection data in the target area on the official public data platform, generate the initial URL, and taking the strong convection forecast from China Weather Network http://products.weather.com.cn as example, regard it as initial URL. meanwhile associate and store the relevant URL in the database.

2) Keep to retrieve based on new URL, key words of relevant areas, date and other relevant data and website of strong convection.

3) According to the completion of database combed and issued by news, set the conditions of judgement. If meet the condition, then terminate the crawler.

4) Classify images, data and others based on the algorithm and the layout logic of news required for strong convection weather forecast

1) Association Degree and Reliability of Association Rules

In the mining of meteorological disasters, early warning and other related website data published by portals and official websites on the Internet, an essential content factor is the connection between various of data. And it is required to segment and summarize these algorithms. Assume that the meteorological disaster related data retrieval set we apply is I={i1,i2,⋯,im}, D is the database during disaster, then we can indicate any meteorological disaster event by applying (ID, T). ID is the corresponding event number, T={i1,i2,⋯,in} represents the data related to early warning of natural disaster. Therefore, we have three definitions as below which is according to the content of natural disasters:

Definition 1. *The association degree of association rules, representing that the ratio relationship between the natural disaster data set containing both X and Y and the total natural disaster data set. The expression is shown as formula (1):*

$$\mathrm{support}(X \to Y) = |\{T: X \cup Y \subseteq T, T \in D\}|/|\mathrm{D}| \quad (1)$$

Definition 2. *The reliability of association rules, representing the ratio relationship between the natural disaster data set containing both X and Y and the natural disaster data set only containing X. The general expression is as is shown as formula (2):*

$$confidence = (X \to Y) = |\{T: X \cup Y \subseteq T, T \in D\}|/|\mathrm{T}: \mathrm{X} \subseteq T, T \in D| \quad (2)$$

Definition 3. *When the association degree of project collection support (X) is more than minimum value, then this weather disaster data set is regarded as the data set of frequency natural disaster.*

2) Bayesian Network Algorithm Model Based on Natural Disaster Data Analysis

For the Bayesian network algorithm model, we apply it to the relevant models of natural disaster data digging. It is not hard for us to promote it to natural disaster data digging according to chain rule of probability(shown as formula (3)).

$$\mathrm{P}(\mathrm{X_1},\ldots,\mathrm{X_n}) = \prod_{i=1}^{n} P(X_i|X_1, X_2, \ldots X_{i-1}) \quad (3)$$

Among of it, x is the smallest non independent subset related to natural disasters, and parent (Xi) ⊆ {x1, X2,..., Xi - 1} is as follows: P(Xi|X1,X2,⋯,Xi -1)=P(Xi|Parent(Xi)). When we are

talking about variable assignment, it can be promoted to Bayesian network joint probability distribution based on natural disaster data mining [7],which is shown as formula (4).

$$P(X_1,\ldots,X_n)= \prod_{i=1}^{n} P(X_i|Val(Parent(X_{i-1}))) = \prod_{i=1}^{n} \theta_{X_i|Val(Parent(X_i))} \quad (4)$$

We can design the Bayesian network retrieval process of the Internet such as natural disaster portal and official website data release:

1) Confirm the value scope of relevant scientific data of natural disaster, such as the radar reflectivity, rainfall, etc. when strong convective weather occurs, and the wind speed value of typhoon weather and others. Then classify according to specific characteristics.

   Confirm the reliability relationship between different data variables, which is used to build structural schematic with direction but without ring, so as to build the Bayesian Internet structure, that is: based on a certain kind of logic order, make variable X satisfy the condition of Parent(Xi) (i=1 ,2 ,⋯ ,n).

2) Regulate or obtain local probability through learning P(xi|Parent(Xi)) to confirm relevant parameters of Bayesian model of natural disaster [7].

B. Image Recognition and Classification Algorithm of Disaster Weather Warning Based on Convolution Network

1) The Algorithm Based on AlexNet Model's Convolution Network

There is 11 layers of convolution network in total in the deep learning model brought up by Alex Krizhevshy, including convolution layer, pooling layer and full connection layer.

The main steps of convolution and pooling are as below:

$$N = \frac{W-F+2P}{S}+1 \quad (5)$$

$$N = \frac{W-F}{S}+1 \quad (6)$$

Applied to the deep learning related to disaster weather images, we can obtain the AlexNet size of feature matrix based on disaster weather convolution and pooling: W means the height and width of feature matrix of disaster weather data, F means the size of the convolution core /pooling core of disaster weather images, P represents the number of disaster weather feature matrix plus 0, and S means the step size of convolution or pooling of disaster weather images. If S<=1, then formula (5) works. If S>1, then formula (6) works [8].

2) Algorithm Based on ResNet Network

ResNet network is a neural network brought up in 2015. Compared with traditional neural network structure (series stacking of convolution layer and full connection layer according to the simple logic), and along with the deepening of the network, and in order to avoid performance degradation, the concept of residual learning is added, meaning "cross layer connection" is stacked. Shown as below figure 3, the input of Internet structure is X, output of F(X)+X, which avoids the degradation of neural network to a certain extent.

Below are the two typical ResNet structures as BasicBlock structure and BasicNect structure:

Shown as figure 4, the BasicBlockstructure is the scenario with a shallow network, composed by two 3*3 convolution layers. The number of paths is 64.

Shown as figure 5, the BasicNect structure is suitable for the scenario with deeper network. First is 1*1 convolution layer with the number of paths as 64. And next is 3*3 convolution layer with the number of paths as 64. The last is 1*1 convolution layer with the number of paths as 256 [8].

C. Image Recognition and Classification Application of Disaster Weather Warning

Image recognition and classification of disaster weather warning based on convolution network and shown as figure 6, we take the strong convective weather, geological disaster, dry weather and typhoon tracks as typical disaster weather cases.

- Train the images of disaster weather, analyze and extract the feature values of various of disaster weather. Most of the disaster images are classified by color representation, therefore, the extraction of color feature is one of the most important standards.

For example, the amount of precipitation of strong convection, the green, blue and pink color are taken as major colors to distinguish the amount of precipitation. In the training process of precipitation related samples, firstly, it is needed to read the classification and benchmark of the basic image palette (different publishing platforms, different countries and regions will have different color representations of strong convective weather).

The typhoon track in the national precipitation forecast map describes the relevant positions in yellow and the longitude and latitude of the map, and obtains real-time information of the typhoon track by analyzing the corresponding colors.

Dry weather is described by white, yellow, orange, red and brown as no drought, light drought, medium drought, heavy drought and special drought.

Geological disasters are described in red, orange and yellow as extremely high risk, high risk and higher risk.

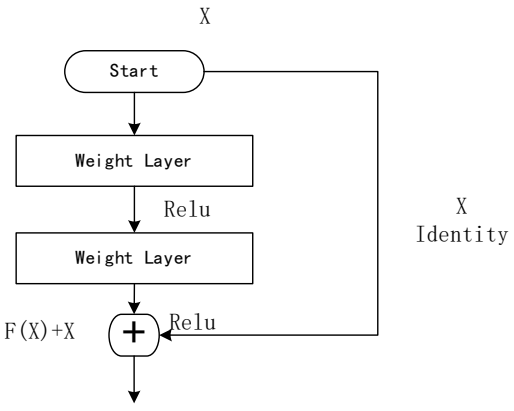

Fig. 3. ResNet structure

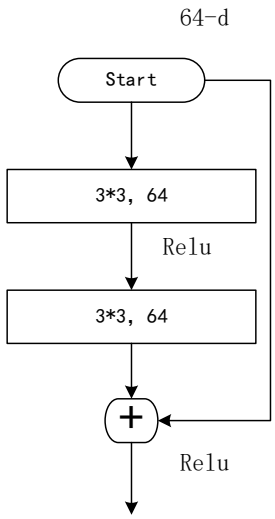

Fig. 4. BasicBlock structure

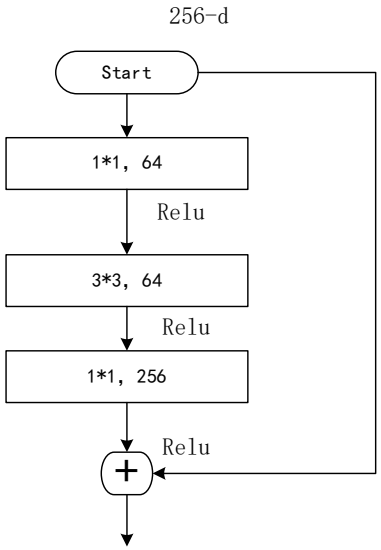

Fig. 5. BotteNeck structure

- Carry out the training initialization on disaster images based on the extracted disaster weather feature data, the details include:
    - initialize the structure and parameters of strong convection, set the weight and threshold value
    - initialize the structure and parameters of geographical disaster, set the weight and threshold value
    - initialize the structure and parameters of dry weather, set the weight and threshold value
    - initialize the structure and parameters of typhoon track, set the weight and threshold value
- Carry out training based on existing feature and target values, including
    - Adjust the relevant threshold of strong convection and calculate the error value
    - Adjust the relevant threshold of geographical disaster and calculate the error value
    - Adjust the relevant threshold of dry weather and calculate the error value
    - Adjust the relevant threshold of typhoon track and calculate the error value
- Firstly, sort out the results after training the network, and then test network respectively by strong convection, geological disasters, dry weather and test images of typhoons.
- According to the test results, output the corresponding strong convection identification results, geological disaster identification results, dry weather identification results and typhoon path identification results.

Above is typical disaster weather related research, which can be extended to other related disaster warning, such as blizzard forecast, hail forecast, haze warning and so on.

1) Application of Convolutional Neural Network Based Disaster Weather Warning Classification and Recognition

Selection basis of sample data during the empirical analysis:

Firstly, the data of disaster weather are selected as samples for analysis for two reasons: firstly, the data and images related to disaster weather are more common, typical and representative. Secondly, the types of weather are more complicated, such as strong convection, morning fog, drought, etc. The samples are richer and can be used as typical samples for crawlers and neural network training. In refining the samples, that is, in selecting the samples of disaster weather types, we cited the most common disaster weather samples, that is, strong convective weather (precipitation), dry weather, geological disasters, and typhoons.

Regarding the choice of training model structure: convolutional + fully connected network) or using the classical ResNet network, this training to typical convolutional neural network as the main method, the specific model structure is shown as Figure 7.

After three layers of convolution, the feature maps are flattened and fully connected to output the score values of the respective classification results, with the largest score being the predicted category.

Since the main sample data is image data, our main model structure is the typical convolutional neural network (based on

Training outcome:

We apply convolutional neural network to classify and identify disaster weather warnings by using four types of disaster weather warnings: strong convective weather (precipitation), dry weather, national geological disaster, and typhoon as experimental samples, the partical training daily record is shown as Figure 8.

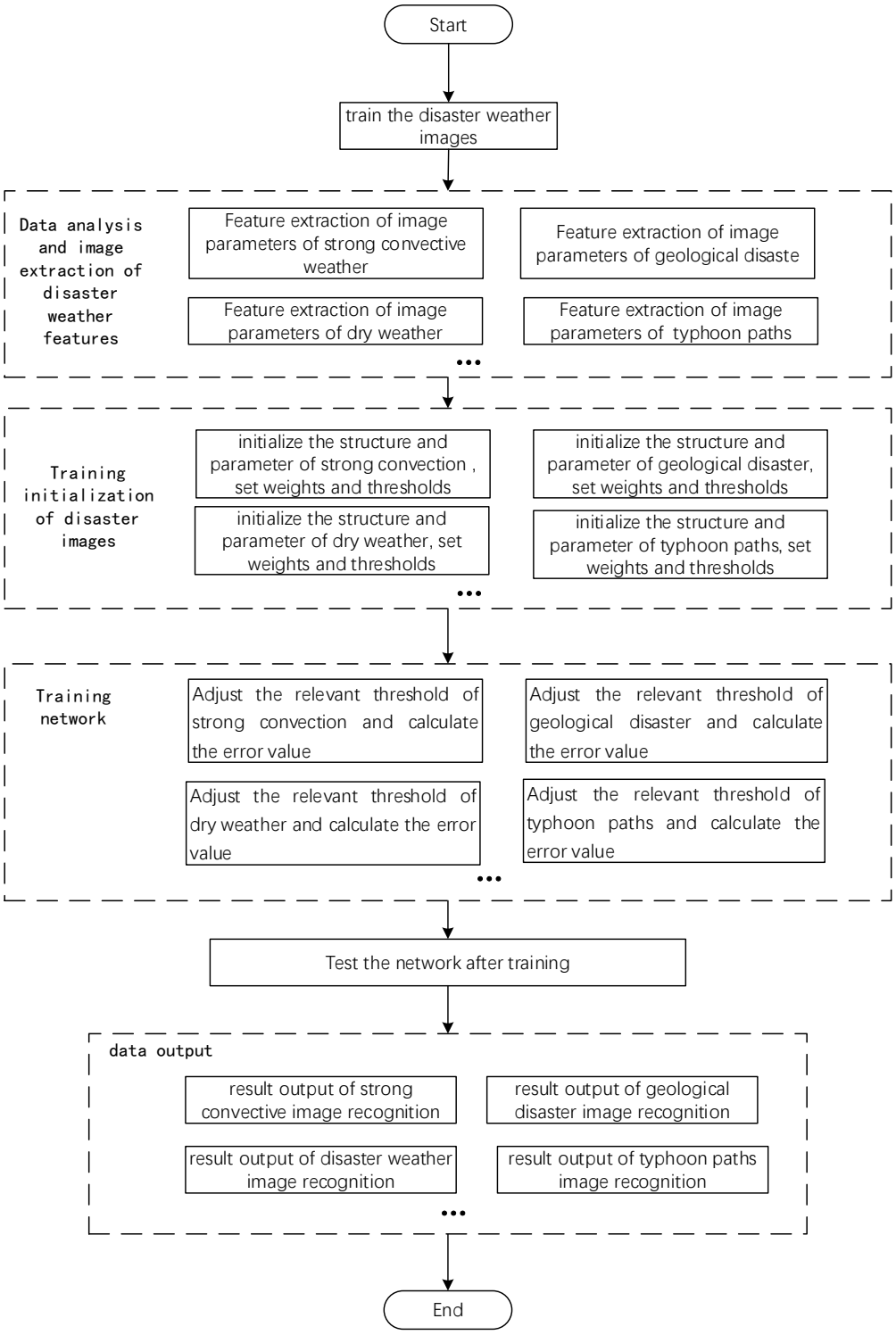

Fig. 6. The flow chart of images recognition and classification of disaster weather warning based on convolution network

Fig. 7. ResNet structure

```
epoch: 0, batch_id: 1, loss is: [1.7861998]
epoch: 0, batch_id: 2, loss is: [4.099582]
epoch: 0, batch_id: 3, loss is: [5.5530577]
epoch: 0, batch_id: 4, loss is: [5.3892183]
[validation] accuracy/loss: 0.5/1.0265110731124878
epoch: 1, batch_id: 1, loss is: [3.269645]
epoch: 1, batch_id: 2, loss is: [0.4133093]
epoch: 1, batch_id: 3, loss is: [2.293334]
epoch: 1, batch_id: 4, loss is: [0.77810025]
[validation] accuracy/loss: 0.75/2.132014036178589
epoch: 2, batch_id: 1, loss is: [0.29641548]
epoch: 2, batch_id: 2, loss is: [1.7968177]
epoch: 2, batch_id: 3, loss is: [1.9753304]
epoch: 2, batch_id: 4, loss is: [0.29659876]
[validation] accuracy/loss: 0.75/2.0615782737731934
epoch: 3, batch_id: 1, loss is: [0.6337707]
epoch: 3, batch_id: 2, loss is: [0.09887589]
epoch: 3, batch_id: 3, loss is: [0.1073596]
epoch: 3, batch_id: 4, loss is: [0.27122128]
[validation] accuracy/loss: 0.75/0.819123387336731
epoch: 4, batch_id: 1, loss is: [0.02826863]
epoch: 4, batch_id: 2, loss is: [0.10039896]
epoch: 4, batch_id: 3, loss is: [0.258783]
epoch: 4, batch_id: 4, loss is: [0.031728]
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Fig. 8. Partical training daily record

D. Analysis and Conclusion

Through the algorithm study in 3.1-3.3, as well as the training and analysis with disaster weather as the sample, we can conclude that the data of disaster news reports are related to images.

(1) The crawler algorithm logic for early warning and real-time data of disaster images can be further analyzed according to the specific time date and geographical area in addition to the type name of the disaster, so that real-time and predicted data and images can be acquired for disasters in any administrative area, and the timeliness of the material is improved, which helps the rapid and automatic generation of news reports.

(2) By training a typical convolutional neural network for disaster weather, we train and classify different disaster weather, and by the relevant disaster weather features (e.g., strong convective weather names as well as color intensity), we can quickly classify the disaster weather. Extending to the classification and recognition of other types of disaster-related data and images, we can perform relevant training to achieve artificial intelligence recognition of different disasters based on standardized title names as well as image features.

(3) Absolutely, the crawler algorithm and typical Convolutional neural network training have some limitations related to disaster news reporting. First of all, the crawler algorithm, we can only have access to publicly available weather-related website data, for overseas data, unpublished related weather information, we cannot get. On the other hand, our typical convolutional neural network based recognition classification also has some limitations, for example, the color standard (palette) of disaster images in different countries will be different to some extent, so that the classification recognition will encounter related problems when dealing with publicly available disaster warning and real-time images from different countries, so we can only recognize training and classification for images with consistent disaster image palette.

IV. Future Development: Challenges and Opportunities

A. Challenges: Artificial Intelligence Abuse

1) Law Risk

Along with the social development and progress of technology, the artificial intelligence will gradually replace many human positions, and the human reply more and more on artificial intelligence. As a kind of high-tech, the damages brought by illegal and criminal activities carried out by using artificial intelligence technology are great. If these behaviors and activities are not stopped by law in time, it will become one of the factors leading social instability. The artificial intelligence technology has been gradually rooted in many fields, resulting in more and more ethical and legal disputes. For example, in the production of data news report, the arguments on the ownership of copyright and right of author of artificial intelligence are never stopped.

In recent years, the shortcomings of artificial intelligence technology have been gradually emerged in the news practice, and the pursuit of news production subject to interests is increasing day by day. The shortcomings of artificial intelligence and supervision regulation of press field, and the incomplete ethical system of news profession have all led to the prominence of new ethics and legal issues in the process of combining artificial intelligence with journalism. As a consequence, we need to re consider the solution of news ethics [9].

2) Deep Forgery and Ethical Issues

Deep forgery is a forgery technology generated on the foundation of artificial intelligence deep learning, which mainly forges other people's facial expressions and voices in real time by using of artificial intelligence technology, and combines it into new videos. In December,2017, a user named "deepfake" posted a pornographic video impersonating a well-known Hollywood actress on a foreign website "Reddit", instantly activating a carnival on the Internet. Deep forgery has been applied in the film and television industry a few years ago, creating special efforts scenes and makeup to achieve more refined communication effects. However, at the same time, it also provides opportunities for people with ulterior motives [10].

B. Opportunity: Overcome Difficulties

1) Automatic Writing of Disaster Weather News Based on Artificial Intelligence

Based on current deep learning technology, we can sort out and recognize the real-time disaster warning data and carry out a series of classification. However, if edit these materials into formal news that can be output directly so as to realize automatic writing, a certain of technical difficulties still exists. Below is mainly to carry out analysis in two perspectives:

- News writing has a certain degree of subjective thinking and opinions of the writer, so as the disaster weather news. Except information related to disaster warning, it may still contain the prevention measurements, notices, and subjective opinions under detailed situation. Taking the most common strong convective weather as the sample, except reporting the forecast, strength and others of rainfall, it still needs to prepare some special prevention measurements combined with the terrain, topography, crowd density, morning and evening peak travel of a specific area. All of these have opinions and evaluation of subjective thinking. Therefore, the writing of disaster weather news still needs a certain degree of artificial assessment and modification.
- Achieve the technical challenges needed by automatic writing. Based on above analysis, we know the key point of realizing automatic writing is to realize the consideration of factors with subjective thinking patterns, which involve in humanities, environment, geography, politics and other elements. Therefore, sufficient data samples are needed, and then an algorithm that can simulate news schemes with appropriate subjective thinking should be available. So the news writers can be completely replaced and editing of news.

2) Timeliness of Disaster News

As we know, the special feature of disaster early warning news and other news is that they have a certain of timeliness. Due to it is involved in paying attentions to the safety of relevant groups, and leaving enough time to make corresponding prevention measures, therefore, it certainly has a request of timeliness of disaster news.

First of all, with the help of artificial intelligence, compared with traditional news writing, the semi self-help mode of early warning of disaster weather news has been certainly increased efficiency. However, with the special timeliness request of disaster weather, it still faces the challenge of improving efficiency. The details include below aspects:

- Improve the efficiency of computer's calculation efficiency and performance. Due to a huge amount of historical data and samples is needed, deep learning of disaster news requires large amounts of calculation resource. Therefore, in the perspective of test and business operation, both need higher amount of calculation resources.
- Optimize storage structure and logic. For example, based on the advantages of cloud calculation, apply objective storage to separately store static data and dynamic data. Meanwhile, realize the separation of read and writing.
- Due to the disaster weather forecast has a request of timeliness even to minutes and seconds, how to optimize the algorithm and logic of deep learning, how to quickly obtain sample data and complete initial writing of news in the soonest time are the challenges that need to be consistently optimized and improved.

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