

Study Group 'AI governance and its Evaluation'
Report on the Session #11

1. Introduction

The Japan Deep Learning Association establishes study groups as a forum for deepening knowledge and discussing domestic and international policy trends related to artificial intelligence (hereafter AI) and Deep Learning (hereafter DL). This study group, "AI Governance and its Evaluation," defines "governance" as a system of management and evaluation by various actors, and launched a study group in July 2020 to investigate what forms of governance are possible and conduct a year-long study to help build trustworthy AI systems.

In the 11th session (April 13, 2021), Mr. Yuichiro Nishi of Weathernews Inc. presented a topic under the theme of "Open Data" for AI governance.

This report is a reconstruction of the topical presentations and the discussions of the study group participants.

2. Use of Open Data in Weather Services

Mr. Nishi gave a presentation on the topic "Use of Open Data in Weather Services".

Overview of Weathernews Inc.

The origins of Weathernews Inc. can be traced back to a tragic maritime accident that occurred at the port of Onahama in Fukushima Prefecture, Japan in January 1970. At the time, it was predicted that a bomb cyclone would pass through the port of Onahama, and although a weather advisory was issued, such important information could not be conveyed to the crew at anchor in the harbor, so they were unable to evacuate, and the cargo vessel sank, claiming 15 lives. Mr. Ishibashi, the founder of the company, was inspired by this maritime accident to "protect the lives of mariners" and went into the weather forecasting industry, establishing Weathernews Inc. in 1986¹.

About 35 years after its establishment, the company has expanded to 32 locations² in 21 countries. In the early days, the company specialized in marine weather, providing services such as recommending the safest and most economical routes for vessels and

¹ <https://jp.weathernews.com/corporate-outline/our-history/> (in Japanese)

<https://global.weathernews.com/corporate-outline/our-history/> (in English)

² as of May 31, 2020

pinpoint weather service to catering companies in order to eliminate the losses of from unsold box lunches, but with the advancement of meteorological technology, the company now provides a variety of meteorological services (see Table 1).

Table 1: Weather service provided by Weathernews Inc.³

Sea	For Shipping, Offshor, Oil & Gas, Fishery and Logistics Industry
Sky	For Aviation Industry
Land	For the field of Road Management, Railway, Transportation, Disaster Mitigation, Event Management, Facility Management, Manufacturing Management, Telecommunications Carriers, Insurance, Air Quality Analysis, Construction, River Administration, Dynamic Climate Change and Terrestrial Phenomena
Environment	For Retail, Energy supply, Dam Operation and Agriculture Industry
Sports	For Sports Teams, Sports Festival, Motor Sports, Mountain climbing, Football, Baseball, Sky Sports and Pleasure craft
Mobile Internet	For the field of Mobile/Internet weather info, Travel, Farm, Flower planting, Weather Literacy, Disaster Reduction, Star, Photo, Space Weather and Wellness
Broadcast	Broadcasting weather program

Innovation in Meteorology

There are three main innovations in the field of meteorology as follows.

1. AMeDAS (Automated Meteorological Data Acquisition System)
2. Meteorological Satellite, Weather Radar (surface-based observation by remote sensing)
3. Numerical Weather Prediction (NWP, physical simulation by numerical calculation)

AMeDAS⁴ automatically records observation of precipitation, wind direction/ speed,

³ <https://jp.weathernews.com/your-industry/> (in Japanese)

<https://global.weathernews.com/your-industry/> (in English)

⁴ AMeDAS is an abbreviation for Automated Meteorological Data Acquisition System, a regional weather observation system.

temperature, and humidity in real time at about 1,300 locations nationwide (at intervals of about 17 km) in order to monitor weather conditions such as rain, wind, and snow in detail on a temporal and regional basis, and plays an important role in preventing and mitigating the risk of weather-related disasters as well as serving as long-term statistical weather observation data.

Meteorological satellites⁵ and radars⁶ are useful for monitoring the weather and climate of the entire Earth, including the atmosphere, oceans, and snow and ice, by providing uniform (areal) observations of clouds, water vapor, sea ice, etc. over various areas such as seas, deserts, and mountains where surface-based observation is difficult.

Numerical weather prediction calculates weather, temperature, and sunshine duration based on weather observation data from meteorological satellites, such as AMeDAS. This makes it possible to easily grasp estimates of the distribution of weather, temperature, and sunshine duration even in places where there are no observation stations.

One of the services provided by Weathernews Inc. is "Weathernews Report"⁷. Weathernews is gathering photos and comments (so-called sensory data) from Weathernews application users (hereinafter referred to as "general weather reporters") across the country via smartphones and other devices to provide real-time information on the local sky and weather conditions. It also uses deep learning technology to provide detailed weather forecasts for the next 15 hours.

Use and Openness of Weather Observation Data

Since weather observation data is data that captures natural phenomena in space and time, the amount of data is enormous, and the current geostationary meteorological satellite (Himawari) acquires 200 GB of data per day. In addition, with the development of deep learning technology, there is a growing need to use the results of past weather predictions as learning data, which has been of limited use in the past.

In releasing weather observation data, Weathernews Inc. has a free data policy. The free data policy is based on the principle that the global environment itself does not

<https://www.jma.go.jp/jma/kishou/known/amedas/kaisetsu.html> (in Japanese)

<https://www.jma.go.jp/jma/en/Activities/amedas/amedas.html> (in English)

⁵ https://www.data.jma.go.jp/sat_info/himawari/role.html (in Japanese)

<http://www.jma.go.jp/jma/jma-eng/satellite/himawari89.html> (in English)

⁶ <https://www.jma.go.jp/jma/kishou/known/radar/kaisetsu.html> (in Japanese)

<https://www.jma.go.jp/jma/en/Activities/radar/radar.html> (in English)

⁷ <https://jp.weathernews.com/your-industry/mobile-internet/> (in Japanese)

<https://global.weathernews.com/your-industry/mobile-internet/> (in English)

belong to anyone, and therefore weather observation data of the natural environment is not something that someone occupies, but is common property. On the other hand, however, there is a cost associated with the creation of data. For this reason, Weathernews Inc. believes that it is desirable for the data to be widely used by the general public at an appropriate cost burden.

In addition, Weathernews Inc. is building an interactive network by creating content in the form of "Crowdsourced Weather," an application that combines weather observation data with highly dense sensory data from general weather reporters. In order to prevent the contamination of the deep learning results, it is important to ensure the quality of the sensory data by removing noise using statistical methods and full inspection.

We believe that there is currently no effective way to prevent the misuse of open data. Since there is no definition of what is right and what is wrong, the current solution is to not allow unrestricted use and to confirm the purpose of use on an individual basis, but this is not always followed. Therefore, the best way to maximize the gain from data utilization is to reduce the relative risk of misuse, and in maximizing the gain, it is desirable to make data open.

The openness of weather observation data is currently at the stage of building up a track record of use. In the initial stage, it will be difficult for weather service users to share the cost of data creation, so it is desirable to spread the use of data by actively utilizing social capital and lowering the hurdle for data use.

3. Discussion points in Question & Answer session

In the 11th session, the contents of the study on "Open Data" for AI governance was discussed. The following questions and answers were raised based on the topic presented.

About Services provided by Weathernews Inc.

- ✓ Since its inception, Weathernews Inc. has been proposing and developing content for countermeasures against weather-related risks in wide range of industries and providing consultations to various companies. For example, a typical shipping weather service is to predict and visualize voyage planning risks such as excessive fuel use and arrival delays, which are predicted based on business data such as fuel consumption and voyage schedules, as well as weather and marine data.

Possible Misuse of Weather observation data

- ✓ In some cases, airplanes are captured in the data acquired by weather radar. Some countries even treat meteorological data as military secrets, so if the information on that plane falls under the category of state secrets, it could be misused for military

or intelligence activities.

- ✓ Weathernews Inc. does not have a clear policy on the needs for national or military use of weather observation data at this moment.
- ✓ If meteorological engineering using weather observation data is developed, it will be possible to intentionally generate natural disasters in specific areas.

Data Utilization at Weathernews Inc.

- ✓ We are trying to improve the accuracy of weather forecasting by using past weather forecast results and actual weather condition as training data for weather forecast models.
- ✓ In recent years, weather that has never been observed in the past has been occurring every year, so the accuracy of weather forecasts must be improved from time to time.

Terms and Conditions for Providing Weather services

- ✓ The Japan Meteorological Agency (JMA) grants various permits and licenses for weather services in accordance with the Meteorological Service Act, and Weathernews Inc. is licensed by the JMA to provide weather forecasting services⁸. The scope of forecasting services under the Act is defined, but there are no restrictions on providing services outside the scope of the Act.
- ✓ Weather observation data must be obtained from officially calibrated instruments for publication. (smartphones, etc., from which sensory data is obtained do not fall under the category of meteorological instruments). For this reason, businesses that are qualified to provide forecasting services are not allowed to include information obtained from sources other than calibrated meteorological instruments in their source data when making weather forecasts.
- ✓ No forecasting license is required if the only purpose is to comment on forecasts issued by the JMA or forecasts issued by other qualified entities.
- ✓ It is a violation if the forecasting service is not conducted in accordance with the Meteorological Service Act.

Credibility of Weather observation data

- ✓ The licensing system for weather services differs from country to country. The U.S. does not have a licensing system and can freely conduct weather forecasting businesses, while China requires a license. Currently, Google and Apple provide weather information on their smartphones based on weather observation data

⁸ https://www.jma.go.jp/jma/kishou/minkan/q_a_m.html

obtained from overseas providers, but these companies are not qualified under the Meteorological Service Act. Since weather information spans the globe, we believe that it is necessary to establish a system and mechanism to ensure the credibility of weather observation data provided by overseas providers, similar to the regulation of the Internet.

We will continue to discuss AI governance in Japan and abroad through this study group.

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<Outline of the 11th Session of the Study Group>

Date & Time: Tuesday, April 13, 2021, 16:00-17:00 (Zoom)

Agenda:

- Topical presentations: " Use of Open Data in Weather Services" provided by Mr. Yuichiro Nishi (Weathernews Inc.)
- Question and answer session / discussion