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A Comparison of Machine Learning Algorithm for Total Cloud Cover Estimation at Airport Position Using GK-2A

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Clouds are important meteorological factor for weather forecast related with high impact weather and the water and energy budgets in the Earth-atmosphere system.
In particular, the total cloud cover(TCC) based on satellite images can overcome the gap in the observation of the TCC observed at station and can be used in solar power generation and short-term weather forecasts.
According to the ground weather observation guidelines, the TCC observation value is expressed from 0(no clouds) to 10(overcast). scale, and the National Meteorological Satellite Center is currently estimating 0-10 TCC using GK-2A.
However, according to the aviation weather observation guidelines, the 0-8 data is used, unlike the ground weather observation guidelines.
machine learning techniques that have been widely used in recent years, we tried to compare and evaluate random forest and deep learning.
The random forest was converted into point data using infrared channels (7-16) minimum, maximum, average, standard deviation, median, band difference, band ratio, and solar and satellite angle for 9x9 pixels around the reference airport position,
and The deep learning used infrared channels (11-16) for 64x64 pixels around the reference airport position and solar and satellite angle.
As a result of the comparison, there was an improvement in accuracy of PC±0:43.32% →48.59%, PC±1:83.38%→88.26%, and PC±2:95.44%→97.10%. The detailed method

and results are will be presented at the conference.

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