

Wide area analysis of video image for ground truth of satellite image

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1997 Fiscal Year Final Research Report Summary

Wide area analysis of video image for ground truth of satellite image

Research Project

Project/Area Number

08650482

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

計測・制御工学

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

1996 – 1997

Keywords

Antarctica / Sea ice / Video image / Satellite image / Ground truth

Research Abstract

Measurement of the seasonal cycle and interannual variations of Antarctic sea ice is important for investigations of global climate and ship navigation. While satellite data give a great amount of information about ice conditions, there still remains a need for in situ validations. Resolution of ground truth reference data is much higher than NOAA satellite data. In order to compare the ground truth data with satellite data, analyzing area of ground truth data have to be expanded by patching the ground based data continuously ; and both need to be analyzed quantitatively.

In the video image analysis, a technique for measuring sea ice characteristics over a wide area using video images taken from a ship is proposed. The sea ice was photographed by video camera from the ship. Continuous video images are obtained using geometric transformation and template matching. Both size of the ice and concentration along the ship's route can be obtained continuously.

The other hand, remote sensing observation from a meteorological satellite offers the best available means to understand polar surface conditions, because of their homogeneity over a wide area. However, in the polar region, cloud, snow and ice have almost the same albedo in the visible channel and the same brightness temperature in the infrared channel. Therefore, it is difficult to distinguish among these regions using only the threshold of gray level of a satellite image. In this work, a method to classify cloud, sea ice and ground is proposed. This study is based upon analysis of the NOAA/AVHRR infrared images in Antarctica. The algorithm consists of two major approaches : extraction of image features and a classification algorithm. Minimum distance classifier was used to classify that region into one of three categories using five image features. To improve the classification accuracy, threshold boundaries for minimum distance classifier were changed. Both classified and misclassified areas were decreased with increasing the threshold levels. In general, the error rates will be decided according to the purpose.

Since both methods of analysis of sea ice characteristics using video image and extraction of sea ice area using satellite data, it is useful for examining the correlation of these two data.▲ Less

Research Products (8 results)

		All	Other
		All	Publications (8 results)
[Publications]	K.Muramoto, T.Yamanouchi: "Classification of polar satellite data using image features and decision tree classifier" Proc.NIPR Symp.Polar Meteorol.Glaciol.10. 127-137 (1996)		▼
[Publications]	K.Muramoto, H.Saito: "Cloud and ice detection using NOAA/AVHRR data" Int.Geosci.Remote Sensing Symp.73-75 (1997)		▼
[Publications]	K.Muramoto, T.Endoh: "Sea ice concentration and floe size distribution in the Antarctic using video image processing" Int.Geosci.Remote Sensing Symp.414-416 (1997)		▼
[Publications]	K.Muramoto, M.Kubo: "Classification of polar satellite data using minimum distance method" Proc.Int.Symp.Environ.Res.Antarctic.(in print). (1998)		▼
[Publications]	K.Muramoto, T.Yamanouchi: "Classification of polar satellite data using image features and decision tree classifier" Proc.NIPR Symp.Polar Meteorol.Glaciol.10. 127-137 (1996)		▼
[Publications]	K.Muramoto, H.Saito: "Cloud and ice detection using NOAA/AVHRR data" Int.Geosci.Remote Sensing Symp.73-75 (1997)		▼
[Publications]	K.Muramoto, T.Endoh: "Sea ice concentration and floe size distribution in the Antarctic using video image processing" Int.Geosci.Remote Sensing Symp.414-416 (1997)		▼
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