

A Similar Image Retrieval System for Auroral All-Sky Images Based on Local Features and Color Filtering

Authors : Takanori Tanaka, Daisuke Kitao, Daisuke Ikeda

Abstract : The aurora is an attractive phenomenon but it is difficult to understand the whole mechanism of it. An approach of data-intensive science might be an effective approach to elucidate such a difficult phenomenon. To do that we need labeled data, which shows when and what types of auroras, have appeared. In this paper, we propose an image retrieval system for auroral all-sky images, some of which include discrete and diffuse aurora, and the other do not any aurora. The proposed system retrieves images which are similar to the query image by using a popular image recognition method. Using 300 all-sky images obtained at Tromso Norway, we evaluate two methods of image recognition methods with or without our original color filtering method. The best performance is achieved when SIFT with the color filtering is used and its accuracy is 81.7% for discrete auroras and 86.7% for diffuse auroras.

Keywords : data-intensive science, image classification, content-based image retrieval, aurora

Conference Title : ICES 2015 : International Conference on e-Science

Conference Location : London, United Kingdom

Conference Dates : January 19-20, 2015