

Random Subspace Neural Classifier for Meteor Recognition in the Night Sky

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Abstract : This article describes the Random Subspace Neural Classifier (RSC) for the recognition of meteors in the night sky. We used images of meteors entering the atmosphere at night between 8:00 p.m.-5: 00 a.m. The objective of this project is to classify meteor and star images (with stars as the image background). The monitoring of the sky and the classification of meteors are made for future applications by scientists. The image database was collected from different websites. We worked with RGB-type images with dimensions of 220x220 pixels stored in the BitMap Protocol (BMP) format. Subsequent window scanning and processing were carried out for each image. The scan window where the characteristics were extracted had the size of 20x20 pixels with a scanning step size of 10 pixels. Brightness, contrast and contour orientation histograms were used as inputs for the RSC. The RSC worked with two classes and classified into: 1) with meteors and 2) without meteors. Different tests were carried out by varying the number of training cycles and the number of images for training and recognition. The percentage error for the neural classifier was calculated. The results show a good RSC classifier response with 89% correct recognition. The results of these experiments are presented and discussed.

Keywords : contour orientation histogram, meteors, night sky, RSC neural classifier, stars

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