

## Intraframe image processing algorithm for identifying meteors in all-sky images

Alahakoon A.G.P.D.<sup>1</sup>, Amaradasa H.D.S.<sup>1</sup>, Prasad K.V.S.<sup>1</sup>, Vidanagamachchi S. M.<sup>2</sup>, Wickramage N.M.<sup>1</sup> and Mahanama G.D.K.<sup>1\*</sup>

<sup>1</sup>*Department of Physics, University of Ruhuna, Matara, Sri Lanka*

<sup>2</sup>*Department of Computer Science, University of Ruhuna, Matara, Sri Lanka*

An all-sky camera comprises of 180-degree field of view fisheye lens is used in this study to capture the images of meteors. An algorithm has been developed to analyze long-exposure all-sky images by using OpenCV and Python. The algorithm is specially designed to minimize the false detection rate with increasing data volume and to convert all-sky images to grayscale. A threshold limit is applied to find continuous pixel areas. This process allows to find the minimum bound rectangle and to calculate the ratio between short and long edges. Rectangles having ratio under a predefined value are statistically defined as meteors and are saved in memory. This process reduces false detections. The algorithm has been tested repeatedly to conclude its capability to detect bright meteors successfully using one or sequence of long-exposure all-sky images.

**Keywords:** All-sky camera, image processing algorithm, intraframe, long exposure and meteor detection

\*Corresponding author: mahanama@phy.ruh.ac.lk