

## GPU-Accelerated Registration of Hyperspectral Images Using KAZE Features

**Título** GPU-Accelerated Registration of Hyperspectral Images Using KAZE Features

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**Abstract** Image registration is a common task in remote sensing, consisting in aligning different images of the same scene. In the particular case of hyperspectral images, the exploitation not only of the spatial information contained in the image but also of the spectral information helps to improve the registration. An example of registration method exploiting all the information contained in the images is HSI-KAZE, which is based on feature detection and detects keypoints using non-linear diffusion filtering. The algorithm is oriented towards extreme situations in which the images are very different in terms of scale, rotation, and displacement. In this paper, an efficient implementation of the HSI-KAZE algorithm on GPU using CUDA is proposed. A detailed analysis of the implementation as well as a performance comparison to an OpenMP multicore implementation is also presented. The resulting algorithm is suitable for on-board processing of high resolution images.

**Palabras clave** image registration, hyperspectral data, KAZE features, remote sensing, CUDA, GPU

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