

Fourier-Mellin registration of two hyperspectral images (HYFM)

Experimental results related to the paper [Fourier-Mellin registration of two hyperspectral images](#) by Álvaro Ordóñez, Francisco Argüello, and Dora B. Heras, published in International Journal of Remote Sensing.

Abstract

Hyperspectral images contain a great amount of information which can be used to more robustly register such images. In this article, we present a phase correlation method to register two hyperspectral images that takes into account their multiband structure. The proposed method is based on principal component analysis, the multilayer fractional Fourier transform, a combination of log-polar maps, and peak processing. The combination of maps is aimed at highlighting some peaks in the log-polar map using information from different bands. The method is robust and has been successfully tested for any rotation angle with commonly used hyperspectral scenes in remote sensing for scales of up to 7.5× and with pairs of hyperspectral images taken on different dates by the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) sensor for scales of up to 6.0×.

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Algorithm

Compiled program to register two hyperspectral images.

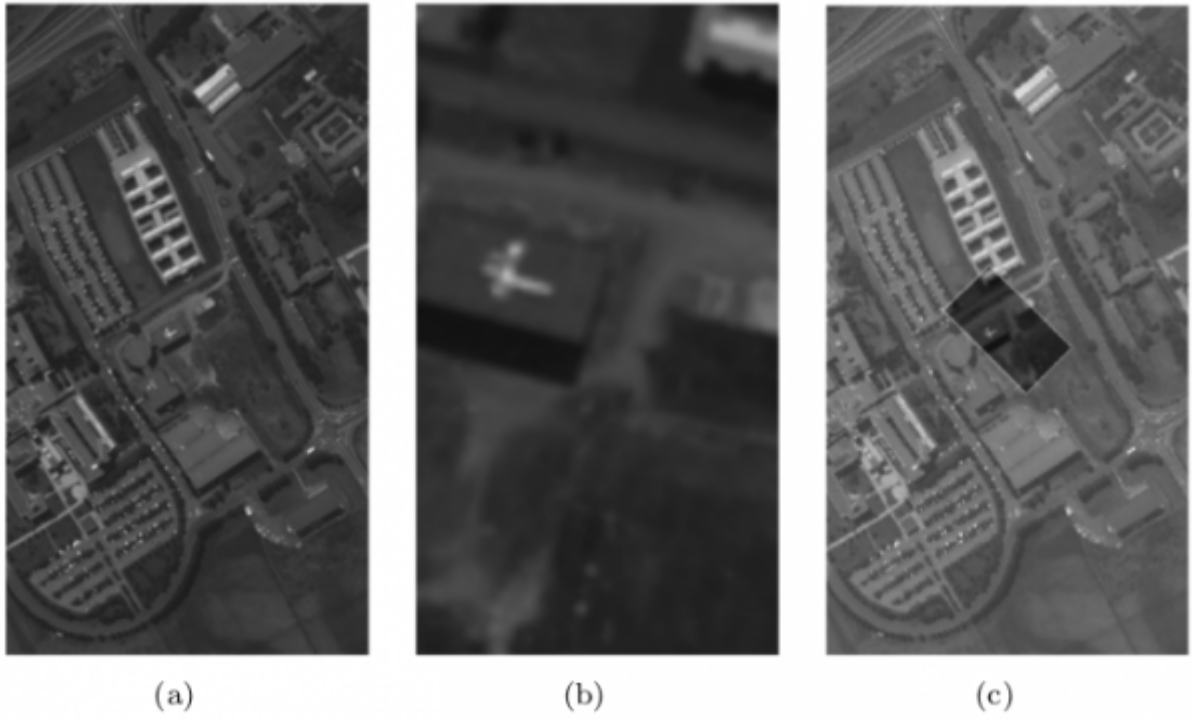
- HYFM algorithm:

hyfm-reg.zip

Images

All images used in the paper are available in [Registration Repository](#)

Example



Example of registration process: (a) original or reference image, (b) target image (central region of the original image scaled by 5.5x and rotated 45 degrees), and © result of the registration process showing the superposition of the reference and target image correctly registered.

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Last update: **2017/11/10 10:47**

