

FINDING THE BEST OPERATING POINT TO PERFORM THE ROBUST PROJECTIVE AND SPECTRAL DISTORTION CORRECTION IN UAV IMAGES

Brayan Acevedo Jaimes^{a1}, Frank Sill Torres^a, Cristiano Leite de Castro^a, Elcio Hideiti Shiguemori^b, Antonio Padua Braga^a and Maria Africano Contreras^a

^a Graduate Program in Electrical Engineering - Federal University of Minas Gerais - Av. Antnio Carlos 6627, 31270-901, Belo Horizonte, MG, Brazil

^bInstitute for Advanced Studies IEAv, Brazil

Received on January 01, 2015 / accepted on *****, 2015

Abstract

This work presents the results and test analysis of a methodology that performs projective and spectral distortion correction, scale adjustment, translation and rotation on aerial images captured by UAV. Aerial images generally do not have nadir view due to turning maneuvers or environmental perturbations. In other cases, this can be because of the type of camera connected to the UAV. The correction of these images becomes the fundamental purpose of the UAV position estimation using template matching because this technique requires that both images (UAV and georeferenced image) have nadir view. Tests were done to characterize and evaluate the methodology performance in order to find the best operating point for all test images. Metrics like efficiency, recall and precision are used in this work. The results showed that it is possible to reduce the processing time that the methodology requires being feasible to be implemented in a real flight environment.

Keywords: UAV, Projective transformation, Nadir View, Template Matching, SURF, MSAC, feature points.

¹payo@ufmg.br