A Method for Mosaicking Aerial Images based on Flight Trajectory and the Calculation of Symmetric Transfer Error per Inlier

In recent years, development of aerial autonomous systems and cameras have allowed increasing enormously the number of aerial images, and their applications in many research areas.

One of the most common applications is the mosaicking of images to improve the analysis by getting representations of larger areas with high spatial resolution.

This paper describes a simple method for mosaicking aerial images acquired by unmanned aerial vehicles during programmed flights. The images were acquired in two scenarios: a city and a forest in the Peruvian Amazon, for vegetation monitoring purposes.

The proposed method is a modification of the automatic homography estimation method using the RANSAC algorithm. It is based on flight trajectory and the calculation of symmetric transfer error per inliers.

This method was implemented in scientific language and the performance was compared with a commercial software with respect to two aspects: processing time and geolocation errors.

We obtained similar results in both aspects with a simple method using images for natural resources monitoring. In the best case, the proposed method is 6 minutes 48 seconds faster than the compared software and, the root mean squared error of geolocation in X-axis and Y-axis obtained by proposed method are less than the obtained by the compared software in 0.5268 and 0.5598 meters respectively.