AUTOMATIC GEOLOCATION OF TARGETS TRACKED BY AERIAL IMAGING PLATFORMS USING SATELLITE IMAGERY

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KEY WORDS: Geolocation, UAV, Image registration, Surveillance

ABSTRACT:

Tracking of targets from aerial platforms is an important activity in several applications, especially surveillance. Knowledge of geolocation of these targets adds additional significant and useful information to the application. This paper determines the geolocation of a target being tracked from an aerial platform using the technique of image registration. Current approaches utilize a POS to determine the location of the aerial platform and then use the same for geolocation of the targets through the principles of photogrammetry. The constraints of cost and low-payload restrict the applicability of this approach from UAVs.

This paper proposes a methodology for determining the geolocation of a target tracked from an aerial platform in partially GPS devoid environment. The method utilises automatic feature based registration technique of a georeferenced satellite image with an aerial image to retrieve the geolocation of the target. Since it is easier to register subsequent aerial images due to similar viewing parameters, the subsequent overlapping images are registered together sequentially resulting in the registration of each of the images with georeferenced satellite image. The result of this registration is overlapped with the initial registered image to obtain resulting registered image and thus location of tracked target in each of the frames. The proposed concept is verified experimentally and the results are found satisfactory. Using the proposed method, a user can obtain location of features on ground without any information for the position of the aerial platform. The proposed approach has applications in surveillance for target tracking, target geolocation as well as in disaster management projects like search and rescue operations.

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