

ABSTRACT

Georeferencing sensor platforms, either airborne -forming part of the known unmanned aerial vehicles (UAVs) - seaborne or land-based, are attracting very much interest in recent years. The use of direct georeferencing techniques allows users to reduce mapping processing times and optimize the generation of cartography and data of different spatial nature.

This Thesis aims the development and implementation of software capable of integrating both the optical sensor calibration of a portable GNSS/INS multi-camera photogrammetric system, and define the geometric relationships between the different sensors on the multicamera mount by means of geometric constraints.. Additionally, the different behaviors of the portable GNSS/INS multi-camera photogrammetric system under different imposed geometric conditions will be studied, varying the number of control points required to achieve an absolute orientation of maximum quality and reliability in the spatial sensor orientation.

The bundle adjustment method will be used for calibration of the sensors integrating the portable GNSS/INS multi-camera photogrammetric system. Mixed georeferencing with control points in UTM coordinates is also implemented in the software. The software acquires the GNSS antenna coordinates and the orientation of the IMU at the time of image acquisition, generating what is known as the direct georeferencing of optical sensors by a non-coupled system.