

IMAGERY-BASED UAS NAVIGATION DATA ANALYSIS

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ABSTRACT:

The Department of Photogrammetry and Geoinformatics (Budapest) purchased a Mikrokopter Okto XL ARF type unmanned aerial system (UAS) with a Sony Alpha NEX-7 camera for research/education purposes. To get the first evaluation of the system positioning performance a student project was launched focusing on the analysis of the stored navigation data obtained by the on-board sensors. The oktokopter is equipped with a GPS receiver (MKGPS printed circuit board), an inertial measurement unit (NaviCtrl board with 9 DOF), a Flight Controller and a Brushless Motor Control unit. These onboard controllers log the sensed and control data which can be compared to the orientation parameters derived from the obtained camera images. The camera imagery was processed by a dense 3D photogrammetry software package, where the exterior orientation data can also be computed. These two independent navigation data sets are then compared by (1) standard statistical tools, and (2) trajectory and orientation function fitting. The paper discusses the initial results of the comparative analysis and provides an overview on the future perspectives that are enabled by the system capabilities.