

PERFORMANCE OF A REAL-TIME SENSOR AND PROCESSING SYSTEM ON A HELICOPTER

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ABSTRACT:

A new optical real-time sensor system (4k system) on a helicopter is now ready to use for applications during disasters, mass events and traffic monitoring scenarios. The sensor was developed light-weighted, small with relatively cheap components in a pylon mounted sideward on a helicopter. The sensor architecture is finally a compromise between the required functionality, the development costs, the weight and the sensor size. On-board processors are integrated in the 4k sensor system for orthophoto generation, for automatic traffic parameter extraction and for data downlinks. It is planned to add real-time processors for person detection and tracking, for DSM generation and for water detection.

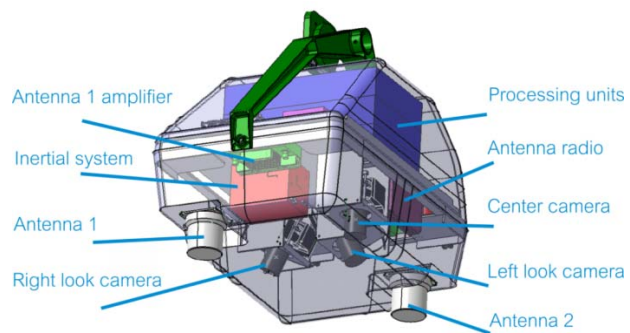
Equipped with the newest and most powerful off-the-shelf cameras available, a wide variety of viewing configurations with a frame rate of up to 12Hz for the different applications is possible. Based on three cameras with 50mm lenses which are looking in different directions, a maximal FOV of 104° is reachable; with 100mm lenses a ground sampling distance of 3.5cm is possible at a flight height of 500m a.g.

Special features of the sensor system are the capability to shoot videos in the 4k format and to acquire images also in the NIR (850nm-1100nm) spectrum. First feature can be used to track persons on ground with a high-resolution and wide-area coverage, whereas the second feature can be used to detect surface water during floods, etc.

In this contribution, we present the first data sets and describe the technical components of the sensor, the geometric and radiometric properties of the sensor, as well as the real time performance of the onboard processors.



Left: 4k sensor mounted on helicopter



Right: Components of the 4k system



Image example of the first flight of 4k system on 16th June 2014