

UAV System With Terrestrial Georeferencing For Small Area Mapping

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SUMMARY

Unmanned Aerial Vehicle System With Terrestrial Direct Georeferencing is a survey and mapping system combining terrestrial survey method and close range photogrammetry. The UAV system capabilities to fly with or without runway make it as a potential application for small area mapping. So that UAV method become a feasible alternative solution to map some cluster of parcels in rural or village area which has less and difficult transportation facility and as the solution to provide spatial data for land administration purpose. UAV technology characterize with low altitude flight, adaptive with the environment, climate condition problem overcoming like cloud cover whereas always be a major problem in satellite imagery and aerial mapping. With knockdown system, aero plane elements assembled easily in all kind of environment. In spite of several benefits, UAV has a major problem in geometric accuracy. In accord with cadastre map for instance, geometric accuracy highly required and Indonesia National Cadaster Office setting up geometric accuracy of cadaster map with government rule. UAV geometric accuracy degradation caused by several factor likes; Platform flight instability and flying height variation as the influence of the wind resulting various photo scale. Modification of existing method must be carried out to solve these problems. The modification offered in this research is the combination between UAV and terrestrial method to overcome geometric problems. The error effect of platform instability significantly reduced using measured coordinate photo from a reflectorless total station on the ground, these coordinate information applying as the coordinate of photo central. Each photo has a central photo coordinate accurately both horizontal (x,y) and vertical (z) whereas in bundle block process will control error of the photo. Total station stand up on a control point and pick every single photo from high resolution RGB digital pocket camera which is mounted inside the platform. Camera shutter pick time and total station coordinate photo take time synchronization was a major problem in this research, specific arrangement required to relate central photo with coordinate data from total station. Specific UAV design and Find fixing UAV is another challenge for surveyor to get used with moving target measurement.