INTISARI

Tidak hanya perangkat keras yang berkembang dalam dunia fotogrmetri, tapi juga perangkat lunak. Banyak perangkat lunak pengolahan foto udara menjadi model 3D dan lebih lanjut diproses sampai pada tahap diperolehnya DEM (*Digital Elevation Model*). Setiap perangkat lunak menggunakan motode yang berbeda untuk menghasilkan model 3D sehingga diperlukan penelitian terhadap ketelitian metode ini. Pada penelitian kali ini menitik beratkan pada metode triangulasi udara dengan PCI Geomatica dan *structure from motion* dengan Agisoft.

Kegiatan analisis pembentukan model 3D menggunakan foto udara daerah Kretek, Bantul. Foto udara diambil menggunaan UAV oleh Badan Informasi Geospasial (BIG). Analisis ini membandingan ketelitian metode triangulasi udara dengan PCI Gematica dan *structure from motion* dengan Agisoft. Tahap pengolahan data, pertama pemilihan foto udara, selanjutnya proses pembentukan 3D sehingga diperoleh nilai DEM. Kemudian proses *filtering* dan diperoleh nilai DTM. Hasil DEM awal dan DTM dilakukan pengujian terhadap kedua metode pembentukan 3D tersebut. Uji kualitas berdasarkan Perka BIG No.15 Tahun 2014 dengan 20 titik sampel pengujan.

Pengujian ini menghasilkan nilai RMSE 20,89 meter dan LE90 34,46 meter untuk triangulasi udara, dan untuk *structure from motion* didapatkan hasil RMSE 3,01 meter dan LE90 4,97 meter. Semakin kecil nilai RMSE dan LE90 maka semakin tinggi nilai ketelitian DEM yang dibentuk. Dari pengujian tersebut dapat diambil kesimpulan bahwa DEM hasil *structure from motion* memiliki ketelitian lebih tinggi dibandingkan DEM hasil triangulasi udara.

Kata kunci: fotogrametri, UAV, triangulasi udara, *structure from motion*, DEM, ketelitian

ABSTRACT

Basically, it is not only the hardware itself which is developed in the Photogrammetry field, but also the software. There are several image processing softwares with the aim to turn into 3D model and processed it further until they got the DEM (Digital Elevation Model). Each of software uses different method to get the 3D model, so that it needs an investigation to validate the accuracy of each methods. This research is focused on the method of aerial triangulation with PCI Geomatica and structure from motion of Agisoft.

This analysis of 3D model formation using aerial photography on the area of Kretek, Bantul. Aerial photographs was taken by using UAV by the Badan Informasi Geospasial (BIG). This analysis compares the accuracy of the aerial triangulation by using PCI Gematica and the structure from motion by using Agisoft. The data processing stage includes, aerial photo selection, then the 3D formation process so that the DEM value is obtained, then filtering process and obtained DTM value. The results of the initial DEM and DTM were analyzed for the both of 3D formation methods. The quality test based on Perka BIG No.15 of 2014 with 20 points sample test.

This analysis produced RMSE and LE90 values. Aerial triangulation has about RMSE 20,89 meter and LE90 34,46 meter while structure from motion obtained from the result of RMSE 3,01 meter and LE90 4,97 meter. The lower value of RMSE and LE90 mean higher the accuracy value of DEM which is formed from the above proccessed. It can be conluded that DEM resulting from structure from motion has higher accuracy compared to DEM resulting from aerial triangulation.

Keywords: Photogrammetry, UAV, aerial triangulation, structure from motion, DEM, accuracy.