

An Innovative 3D Interactive Platform Sourcing Geographic Information Combining Operating Photogrammetry Airborne LiDAR and Mobile Measurement System

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SUMMARY

Abstract As the climate change due to global warming keeps threatening human habitat through increasing intensity and frequencies of natural disasters, an instantaneous 3D geographic information system is highly desirable for governments and societies on disaster prevention, evacuation, rescue, post-disaster restoration, and mitigation. This paper introduces Skyline Global, a 3D interactive GIS containing large volume of spatial information collaboratively collected from operating photogrammetry, airborne LiDAR and Mobile Measurement System (MMS). Developed by Strong JP International Co., the Skyline Global implements the state-of-the-art, non-contact, laser scanning technology based mobile measurement to precisely and efficiently streamline massive geographic map information in an interactive manner. End users may select target positions, turn around, zoom in, and take measurement at their fingertips. The data acquisition integrating airborne camera UltraCam XP and airborne LiDAR Riegl Q680i operating simultaneously. The system features final precise ground elevation profile combining high resolution photogrammetry images at the scale of 10 cm Ground Sample Distance (GSD) and high density point cloud. The full wave form technology enables engineers to acquire high precise ground and vegetation elevation both in mountain and dense forest terrains to generate Digital Elevation Model (DEM) of 1 m raster, and the precision level reaches up to 10 cm in horizontal and vertical directions. The data stored in the Skyline Global is also supplemented by Riegl 250 mobile LiDAR Mobile Measurement System (MMS) at targeted point of interest. This paper summarizes working procedures, lessons learned and knowledge gained through numerous real cases. The case studied proves that the Skyline Global is an advanced technology combining laser scanning technology demonstrated on a 3D working environment not only increases efficiency superseding conventional engineering survey methods but also enhances the level of precision facilitating communication between end users and stakeholders on large volume of spatial information applicable to land management and spatial planning.