Development of lightweight and low-cost fully autonomous hexacopter UAV

ABSTRACT

This research successfully developed a low-cost and lightweight hexacopter UAVs, with total payload of 1.44 kg and flight time of 15.5 min. The assembly and integration techniques cover the UAV's acquisition system, components and calibration, pre-flight check using waypoints, and diagnosis of problems using telemetry logs with or without a gimbal attached. The components and calibrations include LiPo battery, brushless motors, arm, propeller, electronic speed control (ESC), receiver / transmitter and telemetry, gimbal, generating thrust, payload calculation, and compass setting. These research steps significantly improved the method for aerial typical image overlap, by uniformly distributing the images using high overlap set to 80% to avoid gaps and occlusion in the image data. The overlap generated 234 aerial images with ground image resolution of 4.6 cm and 76, 7443 triangle tie-points.

Keyword: UAV; Hexacopter; Gimbal; Thrust; Telemetry

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