Sistem Landing Quadcopter secara Otonom berbasis Citra menggunakan Deep Learning

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ABSTRACT

This research aims to develop an algorithm for the precision vertical landing process on a quadcopter using GPS sensors and computer vision. This research consists of 2 main parts: GPS-based control used by the quadcopter to return to the home area and computer vision-based control in the form of ArUco marker detection, which is used by the quadcopter in order to land precisely. Detection of the ArUco marker that is used goes through 2 stages: the application of threshold and ratio and the process of calculating the black and white area, which can then be searched for four corners of the marker. The algorithm designed works well on the Webots simulation program with mid-computer specifications. The ArUco marker detection process is fast and reliable, so it does not overload the processor unit so that the simulation process can run well. From 30 tests with different initial positions, the average error of the landing position of the quadcopter at coordinate X is 0.02 meters, and coordinates Y is 0.03 meters. All test results show that the quadcopter can land inside the landing pad area without any parts coming out.

Kata Kunci: *Quadcopter, GPS, Computer-Vision, Precision Landing, ArUco Marker*