

# THE DEVELOPMENT OF HEXA-ROTOR AERIAL ROBOT BASED ON MULTI-SENSOR FUSION ALGORITHM

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**ABSTRACT:** Due to the unmanned aerial vehicle (UAV) has the advantages of light weight, small size, and better dynamic performance, it has always been the highlight on research topics in recent years. Today, as the micro electro-mechanical systems (MEMS) is booming rapidly, various sensors and intelligent functions that applied in robots can be transferred and applied to the hexa-rotor aerial robot, as this will make the hexa-rotor become an intelligent robot that can fly. In this research, the dynamic model of the hexa-rotor aerial robot had been studied. The multi-sensor weighted fusion algorithm had been applied to the hexa-rotor aerial robot, and the feasibility had been verified through experiments.

In this research, the multi-sensors fusion algorithm had been applied to the hexa-rotor aerial robot for several functions. The barometric altimeter and ultrasonic sensors were used for altitude hold flight. The infrared sensors and ultrasonic sensors were used for obstacle avoidance. The optical flow sensor was used to guide the hexa-rotor aerial robot to hover around a fixed position in an indoor environments without the GPS positioning. From the experiment results, the hexa-rotor aerial robot can make a fix position flight without GPS positioning, and can avoid the obstacles successfully in extensive range.

**Keywords:** unmanned aerial vehicle (UAV), hexa-rotor, aerial robot, multi-sensors fusion, obstacle avoidance.