

Arduino-Based Quadcopter with Obstacle Avoidance Feature

A Project Work submitted to



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Abstract

An unmanned aerial vehicle also known as UAV is an unpiloted aircraft which can either be remotely operated or flown autonomously based on pre-programmed flight plans. Usually these types of vehicles are used in military applications for missions that are too dangerous for manned aircraft. They are also used in a growing number of civil applications such as aerial photography and the transport of various goods.

Rotating wing (or helicopter) UAVs have the advantage above fixed wing UAVs in many ways; they are able to take off and land vertically, making it possible to hover at a fixed point. The design discussed in this report is based on the development of UAV quad rotor helicopter (Quad Copter), hardware, control system and flight dynamics.

The copter is built of electric motor driven rotors, aluminum , an embedded on-board computer, power distribution system and various sensor units. The hardware platform utilized for the on board computer was a ATmega2560 microcontroller, with 54 Digital I/O pins, 256KB of Flash memory, 8KB of SRAM and 4KB of EEPROM with programming done predominately in C++ to express the control commands and overall system.