

Arduino based UAV quadcopter

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A quadcopter can achieve vertical flight in a stable manner and be used to monitor or collect data in a specific region such as mapping terrains. Technological advances have reduced the cost and increase the performance of the low power microcontrollers that allowed the general public to develop their own quadcopter. The goal of this project is to build, modify and improve an existing quadcopter kit to obtain stable flight, gather and store GPS data and perform auto-commands such as auto-landing. The project used an AeroQuad quadcopter kit that included a frame, motors, electronic speed controllers, Arduino Mega development board and sensor boards and used with the provided AeroQuad software. Batteries, a transmitter, a receiver, a GPS module and a micro SD card adaptor were interfaced with the kit. The AeroQuad software was modified to properly interface the components with the quadcopter kit. Individual components were tested and verified to work properly. Calibration and tuning of the PID controller was done to obtain proper stabilization on each axis using custom PID test benches. Currently, the quadcopter can properly stabilize itself, determine its GPS location and store and log data. This report also described the auto-commands that can be implemented at a later stage. Most of the goals in this project have been achieved, resulting in a stable and maneuverable quadcopter.

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