



Senior Design Project Synopsis - Spring 2014

Multi-Purpose Aerial Drone for Fire Extinguishing and Bridge Inspection

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The purpose of this design project is to create a new generation multi-purpose quadcopter based on the design by a current senior design team composed of Electrical and Computer Engineering students. The current design employs a camera with the primary goal of inspecting large structures and extinguishing fires by use of a chemical extinguisher grenade. This design group intends to improve on the original design for the chemical extinguisher release mechanism in order to present the prototype to Miami-Dade county for possible purchase.

There have been a few issues that have arisen with the current design. The camera is limited on discovering faults or decays within bridges, currently employing a simple visual camera to obtain a surface view of the bridge. The release mechanism of the chemical extinguisher grenade has a major flaw as well; it projects the grenade causing the quadcopter to move backwards due to conservation of momentum, especially since the chemical grenade is substantial in weight as compared to the quadcopter. Another issue is the feasibility of using a quadcopter to extinguish fires. Large fires present a hazard to the quadcopter due to updraft and a small chemical grenade will have little to no effect on the larger fire, so it will not be economical or time efficient to use a quadcopter to put out a large fire.

The final goal of this design project is to improve the current design in order to present the prototype to Miami-Dade County for possible purchase. The current camera must be updated to include a camera with better imaging capabilities. A simple release mechanism will be used that solely drops the chemical grenades onto small fires, which will eliminate the instability issue that the current design has.