

Vision Statement

Team Hex Pistols

Introduction

The environment mapping quadcopter is designed to be able to fly through an unknown area and generate a 3D map of the area using laser sensors.

Description

There are quite a few practical uses for a modified quad-copter. The features we would like to add to our aircraft are the following:

Mapping An Environment

If a rotating laser (LIDAR) was mounted to the aircraft, it is possible to program the device to make a 3 dimensional rendition of the environment through which it travels. This could be very useful for environments that a human cannot safely chart or photograph such as a deep cave.

Following A Specified Target

If a camera and on board processor were mounted to the aircraft, it is possible to program the device to follow a specified target. This could be used for as an automated aerial recording device to gain an unique camera perspective effortlessly. Imagine being able to film yourself snowboarding down a mountain by simply making a gesture to your aircraft at the top of the slope, letting it know to follow overhead.

Essentially we would like to turn the quad-copter into a personal aircraft assistant, easily controlled by simple gestures.

Motivation

As college students interested in extreme sports, our idea stemmed from the thought of an autonomous copter being able to film our performance. For instance, what if a mini robotic helicopter fixed with a camera could follow us around as we ski down a mountain and record our cool stunts? That was our initial fantasy. Then, we realized that this sort of technology could be realistic and useful in many aspects of mapping and tracking. Since NASA is very involved with mapping, surveying, and documenting, we agreed that an autonomous “Quadcopter” that could perform those tasks would be very practical and useful.

Goals

The Quadcopter will follow a target or be remotely controlled. The Quadcopter will use LIDAR technology to visualize, map, and document its surroundings. The Quadcopter could be used for a variety of specifications, and we believe that our proposed project could be the basis of a breakthrough in automated mapping and tracking.

Technologies

The device consists of a three major components: the Parrot AR.Drone 2.0, a LIDAR sensor and a control/communications device based on Arduino. The control/communication device will tell the AR.Drone where to go while processing data from the LIDAR sensor. At the same time, it will stream live data to a controller/monitoring PC to view progress.

List of devices: Parrot AR.Drone 2.0, LIDAR Sensor, Arduino Base Module, Arduino GPS Shield, Arduino Wi-Fi Shield