

DRONE PRODUCT DESCRIPTION AND SPECIFICATION

2/14/16

REVISION 4.0

PRODUCT DESCRIPTION

Our smart drone will be able to track any object in an open field autonomously. It could be your best friend when you want to do outdoor activities. It will capture your moment when you go down a ski slope, or when you make a fancy move while dirt biking. Show off your skills and our smart drone will record it.

MUST

- Our drone must autonomously follow an object in an open field.
- Our drone must track an object based off of image processing techniques rather than tracking a device located on the object.
 - The image processing techniques will be used to process an image of the object uploaded to the drone via the user.
- Objects will be followed from directly behind in the direction of travel at greater than 10 feet distance from the object.
 - The object will travel only in a straight line.
 - The object must not accelerate or decelerate faster than approximately 3 mph (average walking speed of a person).
 - The drone will fly at a height just greater than the height of the object (approximately 7 ft from the ground) to ensure optimal view of the object.
- The drone must have the ability to follow an object on clear or slightly cloudy days.
 - As it stands, the electrical components and circuitry are exposed to the elements. Protective casing is not a prerequisite for us and will be handled if time allows.
- The drone must be constructed using the Quadcopter kit and motors supplied.
- The drone must have a camera capable of streaming video and capturing images onboard.

SHOULD

- Objects will be followed directly behind in the direction of travel at greater than 10 feet distance from the object.
 - The object may travel in a straight line and may turn no greater than 45 degrees.
 - The object must not turn in the same direction twice in a row.
 - The object must not accelerate or decelerate faster than a rate of approximately 20 mph.
- Our drone should track and differentiate unique, specific object among a collection of possible similar objects. For instance, the drone should be able to distinguish between one person and another and appropriately follow the correct person.
- If the drone loses track of an object, the drone will go back to its initial starting position. Losing track of an object is defined as the object leaving the field of view of the camera for longer than 5 seconds.

MAY

- Objects will be followed directly behind in the direction of travel at greater than 10 feet distance from the object.
 - The object may travel in any direction at any time.
 - The object must not accelerate or decelerate faster than a rate of approximately 20 mph.
- An application with a web based GUI may be developed to assist the user in interfacing between their image uploading device and the drone. The application may also assist in storing and/or retrieving saved video/image captures and sensor data.
- The drone may store any relevant information that the user may find useful on an SD card such as, but not limited to, image and video captures.
- The drone may have a protective casing or cover to protect the electrical components from the environment.
- The drone may allow for greater degrees of freedom for camera movement as opposed to the camera being fixed to a single viewing position.
- The drone may scan an object to captures multiple images from various angles of the object that is to be tracked as opposed to a single image of the object being tracked.
- Status LEDS may be implemented to provide the user with potentially relevant information such as battery life, on/off, etc.
- The drone may be able to be thrown into the air for launch as opposed to having to be launched from a launching pad or with the landing gear attached.