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From phone to quad

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# Overview

## Project Background and Description

The purpose of this project is to turn a windows phone, the Lumia 920, into an autonomous quad-copter drone. The Lumia 920 has most of the hardware required to build a quad-copter such as accelerometer, gyroscope, and compass. In addition, the Lumia 920 offers a powerful floating point processor for flight control in a compact form factor.

## Project Scope

This project will create a quad-copter with a Lumia 920 at its core. The Lumia 920 will perform attitude sensing using the onboard gyroscope and accelerometer and control the 4 motors using Bluetooth communication through an Arduino board.

## High-Level Requirements

The proposed system will include the following:

* Attitude sensing
* Brushless motor control
* Computation for closed-loop PID control

## Deliverables

A fully assembled quad-copter with an onboard Lumia 920. The quad-copter will be able to balance at a specific altitude and compensate in the presence of external disturbances.

## Stretch goal

The quadcopter will take real time video capture of its environment. The real time video is streamed to an Amazon AWS cloud. Using monoSLAM techniques, a 3D map of the environment will be created. The quadcopter will use this time of flight map to navigate an unknown area.