**Unmanned Aerial System Control using Gyroscope in Mobile Devices**

A Research Paper

Presented to:

**Engr. Julius Jr. V. Olandria**

Adviser in ECE 170 - System Design/Capstone Project 1

In partial fulfillment of the Requirements

In ECE 170 - System Design/Capstone Project 1

Necesito, Michael John T.

Orcullo, Carl Jev F.

JULY 12, 2021

# **Chapter 1**

## **Background of the Study**

Drones are also called as Unmanned Aerial Vehicles (UAV) or Unmanned Aerial Systems (UAS) and, as their name implies, are aircrafts that can fly without the aid of a pilot and passengers. Instead, drones are controlled either by controlling them remotely via radio waves or using a predetermined route programmed within the UAV themselves [1].

This study focuses on making a drone connected to an Android device via a Bluetooth module, and is controlled by the user using the Android device’s gyroscope and accelerometer.

Bluetooth, according by [2], is defined as a low cost, low power, short range radio technology whose original purpose was to replace wired cables in connecting devices. Come 2010, Bluetooth 4.0 was released—also called as Bluetooth Low Energy (BLE). As defined by [3], BLE supports a hub-and-spoke model of connectivity. That is, one device being a central hub—or simply the “Central”—while other devices connected to it are dubbed “Peripherals”.

## **1.2 Statement of the Problem**

The main underlying issue of the project is connecting an Android phone to a drone equipped with a Bluetooth module. Specifically, the problem that the researchers will try to solve mainly revolves in transmitting an Android phone’s real-time gyroscope and accelerometer data to a drone, allowing it to hover based on the data it received.

## **Objectives**

The researchers aim:

* + 1. **General Objective(s):**

1. To develop a drone that can be controlled using an Android phone’s real-time gyroscope and accelerometer data.
   * 1. **Specific Objective(s):**
2. To create an X-frame drone equipped with a Bluetooth module.
3. To connect the Android device to the drone.
4. To get the Android device’s gyroscope and accelerometer data.
5. To transmit the data to the drone.
6. To move the drone based on the data transmitted.

## **Significance of the Study**

The study will benefit the following:

(…)

## **Scope and Delimitation**

* + 1. **Scope**

The Android device used is (…) and the range for the drone controlled is between 2-3 meters away from the user.

* + 1. **Delimitation**

The paper will not discuss thoroughly the specifics of gyroscopes, Bluetooth LE, and the hardware used to build the robot. Finally, the researchers will be using Blynk as a medium to establish a connection between the Android device and the drone.

# **References**

|  |  |
| --- | --- |
| [1] | P. Kardasz, J. Doskocz, M. Hejduk, P. Wiejkut, en H. Zarzycki, “Drones and possibilities of their using”, *Journal of Civil & Environmental Engineering*, vol 6, no 3, bll 1–7, 2016. |
| [2] | J. Bray en C. F. Sturman, *Bluetooth 1.1: connect without cables*. pearson Education, 2001. |
| [3] | K. Townsend, C. Cufí, R. Davidson, en Others, *Getting started with Bluetooth low energy: tools and techniques for low-power networking*. “ O’Reilly Media, Inc.”, 2014. |