**Project Documentation: Drone Controller with Joystick and Color Detection**

**Project Overview:**

This project involves controlling a drone using an Xbox controller and integrating color detection to trigger certain drone actions based on the colors detected by a camera feed. The project utilizes threading for concurrent execution of joystick control and color detection.

**Components:**

1. **DroneController Class:** Manages the interaction between the Xbox controller and the Pluto drone. It maps joystick inputs to drone control commands and provides methods for arming, disarming, taking off, and landing the drone.
2. **XboxController Class:** Responsible for reading inputs from an Xbox controller connected to the system.
3. **Pluto Module (pluto.py):** Provides the interface to communicate with the Pluto drone, including methods for arming, disarming, taking off, and landing.
4. **Joystick\_control Module:** Handles the interaction with the Xbox controller.
5. **PlutoMultiwii Module:** Contains the implementation for drone control commands specific to Pluto Multiwii flight controllers.
6. **Color Detection:** Utilizes OpenCV to detect predefined colors (red, green, and blue) in the camera feed. Detected colors trigger specific actions on the drone (e.g., takeoff, arm, disarm).

**Usage:**

1. **Setup:**
   * Connect the Xbox controller to the system.
   * Ensure Pluto drone is connected and powered on.
2. **Execution:**
   * Run the provided script (final\_code.py).
   * After taking off drone can be controlled using joystick controls.
3. **Joystick Control:**
   * Use the left joystick for throttle and yaw control.
   * Use the right joystick for pitch and roll control.
   * Press A to arm the drone.
   * Press B to disarm the drone.
   * Press Y to initiate takeoff.
   * Press X to initiate landing.
4. **Color Detection:**
   * The camera feed is processed for detecting red, green, and blue colors.
   * For now we are using webcam.
   * Detected colors trigger specific drone actions:
     + Red: Initiates takeoff.
     + Blue: Disarms the drone.
     + Green: Arms the drone.

**Dependencies:**

* **Python 3:** Programming language used for scripting.
* **OpenCV:** Library for computer vision tasks, used for camera feed processing and color detection.
* **NumPy:** Library for numerical computations, used for array manipulations.