

Human Gesture Control Multiple Quadcopter Drones

Background

Quadcopter drones are popular hobbyist aerial vehicles. The current input methods such as remote control and phone apps can control only one drone, and are too cumbersome and un-intuitive for one to learn quickly.

Objective

- Ease the controlling of aerial vehicle, intuitive
- Fly the drones with minimum guidance
- One person can control multiple quadcopter drones by means of hand gesture.

Setup

- PC: as Control Server
- Galileo Board: Relays command
- AR. Drone: Receives command
- Leap Motion: Gesture input and drone selector
- Human user: Receives video feed from drone
Selects and gives gesture input

System Design

- Each drone hosts a Wireless Access Point (AP) with a Galileo Board connected to using Wi-Fi.
- Able to control unlimited number of drones
- Node.js server to handle concurrency

Results

- Greatly reduce difficulty in controlling a quadcopter
- Novice users can start flying within a minute
- Development work is now being done to achieve good multi-quadcopter control.

Future Work

- Include visual object tracking using the on-board HD camera on the quadcopter
- Automatic flying when human input is absent
- Achieve far range control
- Upgrade to 4G network for communication between Quadcopter and PC Control Server
- Useful for more practical usages like humanitarian disaster relief and military use.

Gesture	Command
Opening fist	Take Off
Palm tilting left/right/front/back	Move (proportionally with angle) left/right/front/back
Fist	Land
Second hand showing finger sign	Select drone by number

