Georgia Tech

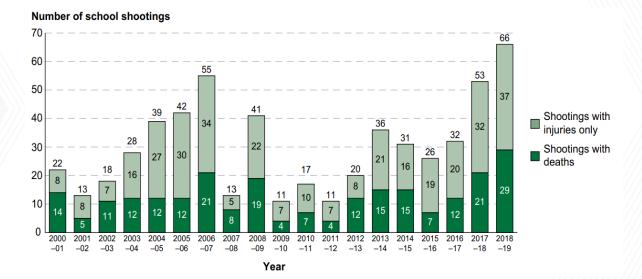
CREATING THE NEXT

Drone Buddy: Semi-Autonomous Surveillance Drone

Sriharsha Singam, Zach Mathews, Jerrin Kakkanatt, George Germanakos

The Problem

- Certain types of crimes have been steadily increasing in recent years
 - Hate crimes
 - Sexual Assault
 - Gun Violence

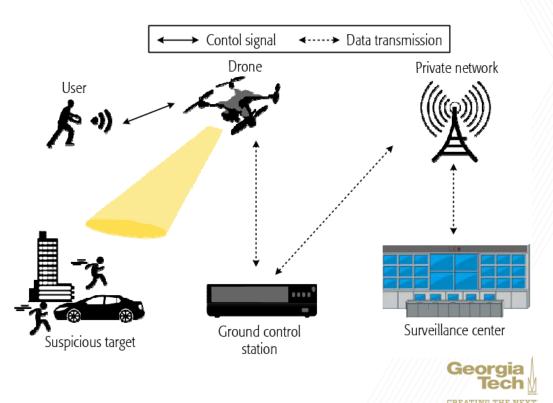


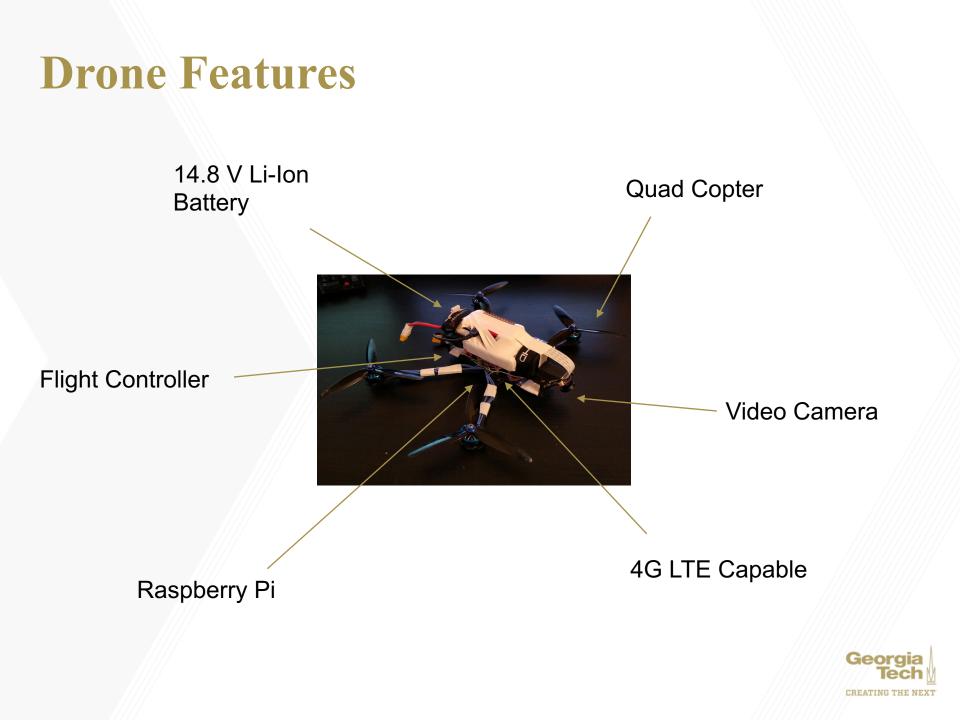
• New, Innovative forms of security will need to be implemented in order to curb crime rates



Our Solution - Drone Buddy

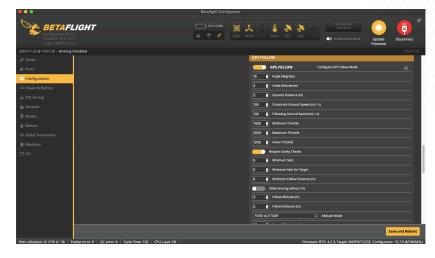
- Semi-autonomous surveillance drone
- Called in through our mobile app
- Flies to the student once called upon
 - Records footage
 - Follows the user
 - Returns once released





Firmware

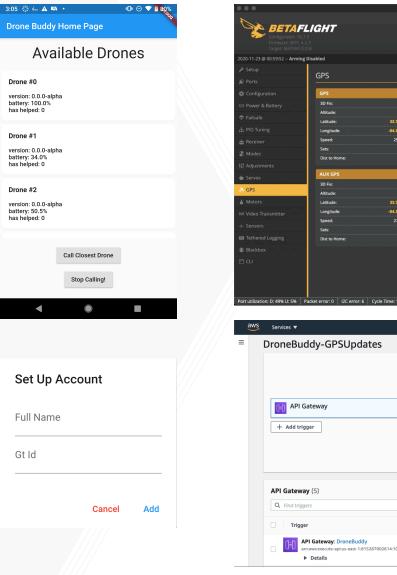
- GitHub was used to manage source code
- Betaflight's open source flight controller firmware was modified to add auxiliary GPS and GPS tracking
- Testing and practice runs done outdoors at Tech Green and Piedmont Park

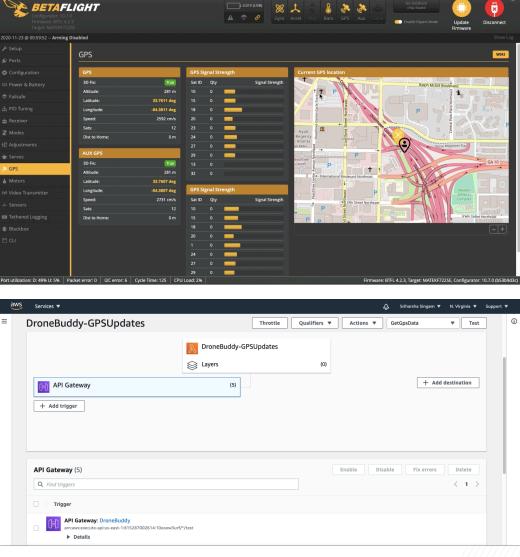


•••	Betaflight Configurato	
Configurator: 10.7.0 Firmware: BTFL 4.2.3 Target: MATSP72255		8 A: A: <t< th=""></t<>
2020-11-23 @ 14:07:35 Arming Disabled		
	AL In-flight level calibration	GPS
j≰ Ports SERVO_TILT	Servo gimbal (GPS GPS for navigation and telemetry
Configuration SOFTSERIAL	Enable CPU based serial ports	
D Power & Battery SONAR	Sonar	Note: Remember to configure a Serial Port (Via Ports tab) when using GPS feature.
di PID Tuning TELEMETRY	Telemetry output	NMEA Protocol
de Receiver LED_STRIP	Multi-color RGB LED strip support	Auto Baud
2 Modes DISPLAY	OLED Screen Display	Auto Config
Motors CHANNEL_FORV	ARDING Forward aux channels to servo outputs	Set Home Point Once
110 Video Transmitter TRANSPONDER	Race Transponder	None Ground Assistance Type
III: Blackbox	Permanently enable Airmode	
	On Screen Display	AUX GPS
DYNAMIC_FILTE	Dynamic gyro notch filtering	AUX_GPS Auxiliary GPS for navigation
		Note: Remember to configure a Serial Port (Via Ports tab) when using GPS feature.
		NMEA Protocol
		Auto Baud
		Auto Config
		Set Home Point Once
		None Ground Assistance Type
		Save and Reboo
Port utilization: D: 34% U: 1% Packet error: 0 I2C error: 6 Cyc	e Time: 125 CPU Load: 2%	Firmware: BTFL 4.2.3, Target: MATEKF722SE, Configurator: 10.7.0 (b53b5



Mobile App GPS Tracking





Georgia

CREATING THE NEXT

Issues

- COVID-19
 - One member caught it and became very sick
 - One member stayed remote entirely
 - Ordered extra parts so that it could be tested remotely by all members
 - Meetings in person were limited
- Incompatible Parts
 - Despite research initial camera, speed controller, and magnetometer were replaced
- Bricked Flight Controller



Future Improvements

- Lights and sound
 - Can be used to further deter violent crimes
- Wireless charging station for convenience
- Weather resistant cover
- Image based motion tracking detection



Let's Create a Safer Campus for All



