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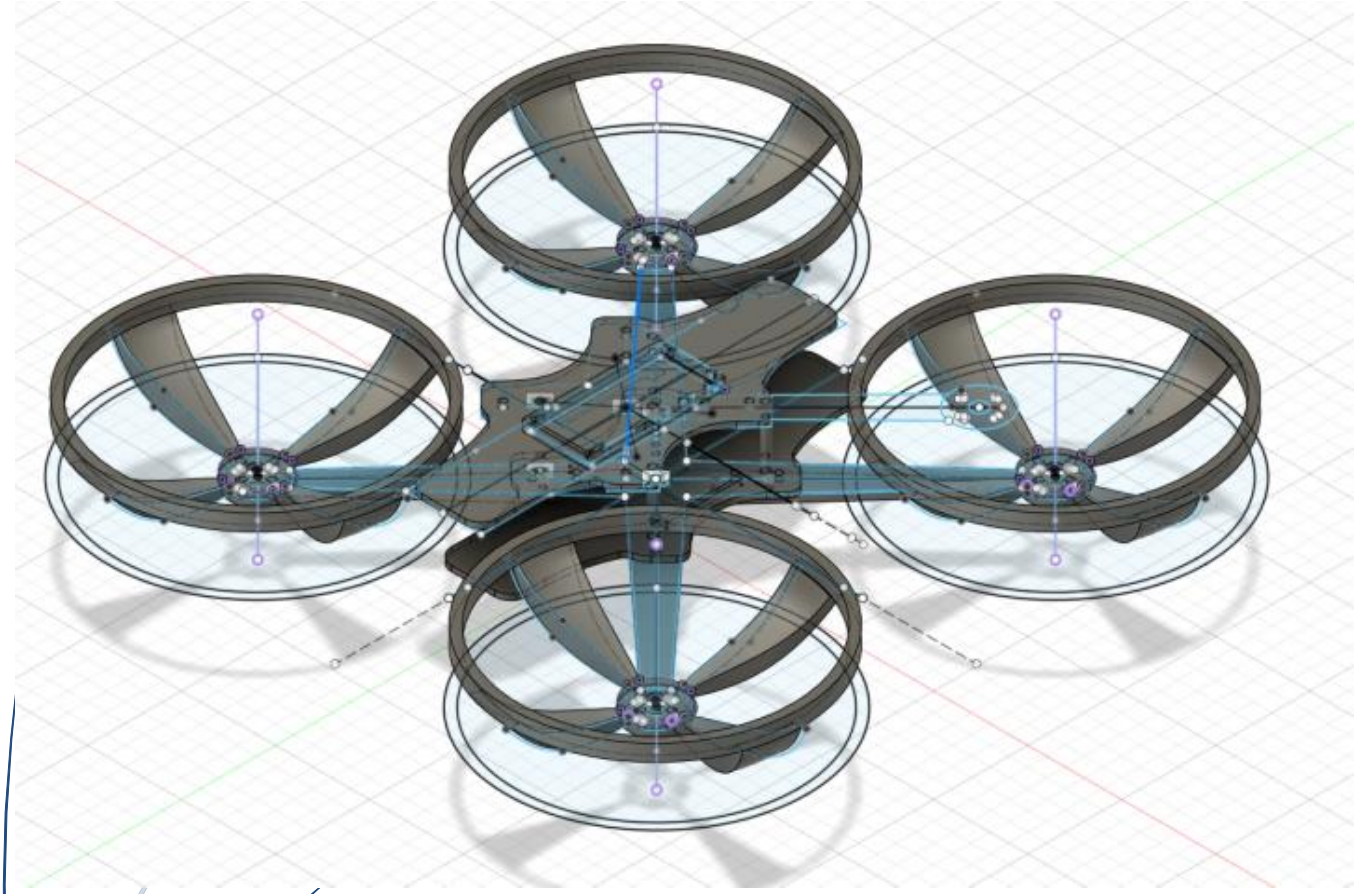
Surveilia Requirements



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Concept

Surveilia is an autonomous security drone, powered by ArduPilot and Raspberry PI.

Intent

Surveilia is a security drone designed to do autonomous patrols in designated areas or routes. The drone could be used to replace or augment physical or remote security with automation. The drone is capable of night vision, allowing it to operate 24 hours a day. Application software allows the user to easily schedule tasks and generate customized settings for preferred behavior.

Requirements

The drone must be able to

- Maneuver in a 3D path
- Log when a person is encountered in the flight path
- Remain stable in flight
- Be configurable
- Have a plottable path

Optional Applications

- Auto home
- Self-charging on auto home
- Autonomous route design

Reference #	Requirement	Test	Pass/Fail Criteria	Criteria Met
001	*Motors must interface with controller*	*Run power to motors through ESC*	*Pass if all motors turn on*	Pass / Fail
002	*Motors must receive controlled pulse modulation*	*Control motor speed with ESC*	*Pass if motors can be controlled with pulses*	Pass / Fail
003	*Motors must be able to operate at different speeds*	*Control each motors speed differently with ESC*	*Pass if every motor is at a different speed*	Pass / Fail
004	*PID controller must maintain motor stability*	*Balance 2 motors on a test bench running PID algorithm*	*Pass if motors self-correct*	Pass / Fail
005	*Drone has stable flight*	*PID testing station, on a teetering wedge*	*Pass if motors align parallel with workbench*	Pass / Fail
006	*Drone can be controlled manually*	*Drone receives input from controller*	*Pass if drone responds to user input*	Pass / Fail
007	*Must fly in a 3D space autonomously*	*Create a boundary in the system, drone must fly randomly with control*	*Pass if drone moves in boundary with no conditioning*	Pass / Fail
008	*Must send flight data to remote console*	*Drone sends test data to GUI.*	*Pass if GUI receives 90% of data at 30 meters from router*	Pass / Fail
009	*Must recognize a human*	*Camera is pointed at random objects and humans*	*Pass if alert is created from viewing humans with 90% accuracy*	Pass / Fail

010	*Must have configurable instructions through a remote console*	*GUI must send test data to drone*	*Pass if drone receives 90% of data at 30 meters from router*	Pass / Fail
011	*Must have a plottable flight path*	*Create flight path with ArduPilot and waypoints*	*Pass if drone collects 100% of waypoints*	Pass / Fail
012	*Must go idle if outside of control range*	*Send drone outside of boundary*	*Pass if drone pauses all processes and hovers indefinitely*	Pass / Fail
013	*Must have automatic initialization*	*Initialize functions on startup*	*Pass if startup procedure is followed*	Pass / Fail
014	*Must have manual interrupt of tasks*	*Interrupt automated flight path with command*	*Pass if tasks are paused after interrupt*	Pass / Fail
015	*Must have battery efficiency*	*Drone is in a hover with all peripherals active*	*Pass if hovers for 59 minutes without recharging*	Pass / Fail
016	*Must have auto-home*	*Drone hovers off of pad and is ordered to home*	*Pass if drone lands back at designated home when commanded*	Pass / Fail