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Project Title: Autonomous Video Surveillance Using a Multicopter UAV

Abstract: The goal of the project is to develop a rotary wing platform for autonomous aerial surveillance. A 3DR X8 multicopter (octocopter) is used as the UAV platform. The multicopter is equipped with a Tarot Gimbal to support a GoPro Hero 4 Black Camera for live video feed and a 3DR Pixhawk autopilot for autonomous flight. This Gimbal allows the camera to stay level while in flight to have a steady live feed, which used the Black Pearl monitor to provide a HD screen in first person view (FPV). The project involved tuning autopilot gains for autonomous flight and using the Mission Planner for setting up autonomous multi-waypoint or circular mission profile. The Mission Planner can be used to change the mission profile in real-time as required for the video surveillance and other tasks. A ground control station (GCS) installed on a computer is used for monitoring the UAV telemetry data in real-time. This allows real-time monitoring of the UAV performance and position as well as for sending correction commands to the UAV if required.