Police body cameras have been a hot topic recently, with controversy surrounding the privacy of officers, the usefulness of the cameras, the policies that should be followed when using footage, and so on [2]. Perhaps one of the most controversial aspects of the police body camera debate is the ability of an officer to disable their camera at will. Reasons ranging from privacy to convenience have been used to support the officers ability to disable the cameras. There may be situations where it would be risky to spend several moments activating the camera, or an officer might forget about the camera in the heat of the moment.

Meanwhile there has been continued progress in bringing helicopter ‘drones’ to the consumer market and many low cost drones are now available. In fact, some police departments have started getting approval to use drones for tasks such as reconnaissance [1]. Privacy concerns notwithstanding, this is becoming more widespread in the United States.

My idea is that drones could be deployed to automatically film police incidents from the air. The system would need to make use of remote drone charging stations and software to automatically travel to the location of a patrol car when a stop is made or when an incident is called in over the radio. This seems like a good way for police departments to make use of drone technology without causing any more concern for privacy than dashcams or body cams already do. To improve response times, the drones would be stationed in a grid over the coverage area at remote self-charging stations. These charging stations would be protected from the elements and would provide a location for the drone to land and charge. Each charging station could service a small number of drones which could operate in shifts when charging...
or depending on demand. Ideally, other than maintenance and repairs, no human involvement would be needed for the operation and deployment of the drones, and the charging stations could be located in. Removing human input from the dispatch process could address some of the controversy surrounding police cameras. Dispatching systems could include GPS monitoring of patrol cars (which is already in use in a large number of departments) or voice recognition of police radio activity.

In order to get useful footage, software to automatically select a good filming distance and angle would be developed. This could involve visual recognition of patrol cars and nearby stopped vehicles and pedestrians, as well as trying to get a view free of intervening obstructions such as trees and power lines. Video processing would be offloaded to a ground based server to avoid requiring a powerful onboard computer. Note that the recording would be unlikely to include useful voice recordings due to the distance involved and drone motor noise, although loud noises such as gunshots could be recorded.

Several problems are likely to arise in this project and some work would need to be done to address or mitigate these problems. One potential source of trouble is the weather. Although drones can be made waterproof, cold temperatures will reduce the effective battery life and high winds could result in drone crashes or inability to take off. Icing could lead to a drone crash in freezing rain. One way to mitigate financial losses due to this problem is to automate the detection of unsafe weather conditions and ceasing automated flights until the weather improves. In such an event, a human operator could still manually fly the drone or authorize individual automated flights if a situation required it.

Another type of problem would occur if a large number of police incidents happened in a short amount of time, since there might not be enough drones to record all of them. With voice recognition and other data sources, it may be possible to design a priority system where priority is given to incidents which are more serious. This would also be a useful feature if a very small drone fleet was being used, such as in a case of limited funds or in a small scale evaluation of the technology.

In order to undertake this project, funding for students with experience in voice and video recognition would be needed, along with sufficient funds to construct a prototype system from mostly off the shelf components. Equipment would include at least one fast waterproof drone with a camera and a charging dock, UHF transceivers, and a server on which to run the video and audio recognition software and the control software.
The first step of this project would be to begin developing visual recognition of police cruisers and developing software to fly the drone to known coordinates and film any police cruisers at that location as well as pedestrians and other cars nearby. For the development and testing of the system, any vehicle (or any large object) could be used to represent the police car. This would be the bulk of the work to get a bare minimum prototype working. After that, each of the aforementioned features would be evaluated and implemented according to their usefulness and feasibility.

If tests are promising then we would need to find a police department willing to deploy a trial system for this technology. Once the software is developed, all physical components of this system are likely to be relatively inexpensive and there would be a low barrier to deploying this technology on a large scale.

References
