Should Drones Be Used by Police in US

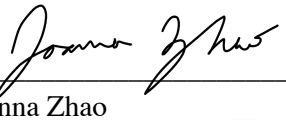
A Research Paper submitted to the Department of Engineering and Society

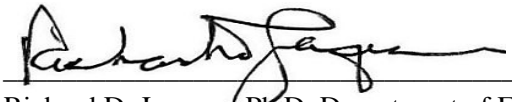
Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Joanna Zhao
Spring, 2021

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Signature  Date 11 May 2021
Joanna Zhao

Approved  Date 08 May 2021
Richard D. Jacques, Ph.D. Department of Engineering and Society

Introduction

Drones (UAVs, unmanned aerial vehicles) are gradually becoming part of peoples' daily lives as drones improve technologically and reduce pricewise. They were developed originally for the military but are now increasingly used by common people for hobby, by professionals for photography, by companies, and by law enforcement agencies. Given how powerful even one drone is, one can imagine how much more powerful it is when multiple drones combine and work together as one unit. This is known as a drone swarm.

My technical project is on the simulation of these drone swarms. As most drone swarms and drone swarm formations are currently controlled centrally, my project is to make the drone swarms a distributed system. This means that each drone is controlled individually by itself, instead of being controlled collectively by one computer or drone. Drone swarms implemented with a distributed system are resilient and hard to fail, destroy, or manipulate. This means that there are no single points of failure because all the drones are independently controlled.

Although drones are powerful, they can be misused and can introduce novel concerns. For my STS research, I am going to study a small part of the ongoing debate regarding concerns on whether drones should be used by the police in the US or not.

Effectiveness

Using drones for security and surveillance significantly improves upon the traditional approaches such as fixed security cameras, especially in terms of minimizing risk ("Drone Surveillance", 2020). Drones can replace human in exploring dangerous situations like shootings, bomb threats, and toxic spills (Feeney, 2016). They can also additionally follow a suspect with a smaller profile than car or helicopter, adjusting for a better view and overcoming obstacles along the way (Laperruque, Janovsky, 2018). In addition, powerful cameras like DJI

Zenmuse Z30, which is quite affordable and is currently in wide use, can perform magnification of up to 180x, enabling users to watch with good precision events happening several miles away (Laperruque, Janovsky, 2018). Technologies like this can also more effectively help law enforcement in finding missing person (Feeney, 2016).

While modern drones are already quite powerful and affordable, costing thousands of dollars as opposed to millions of dollars for police helicopters, they remain a developing technology capable of so much more (Laperruque, Janovsky, 2018). Not only can additional technology be easily added onto drones, including facial recognition, thermal scanner, biometric tech, increasingly precise and wide ranged cameras, the drones themselves can become smaller or larger. “Drones the size of insects already exist, and we should expect surveillance equipment to be attached to such drones as technology improves” (Feeney, 2016).

The list of benefits and potential capabilities of drones continues to increase, especially with respect to the safety, effectiveness, and savings drones can provide. However, just as Leo Marx (1987) asks: "does improved technology mean progress?", we should consider what we are progressing towards with this technology and think about what is to be achieved with it. I believe that improved technology gives humans more power and ability to achieve things, but whether it is progress or not or if it actually brings benefit to the society is not straightforward.

Privacy

One particular concern with the use of drones that we should analyze before determining if this is progress or not is privacy.

A group of researchers have investigated the topic of public perception of drones and privacy and found that people "were less concerned about hobbyists, construction and real estate companies, and more concerned about drones owned by the government, military or law

enforcement. Unmarked drones generated the most privacy concerns" (Rice, 2019). As Schwartz (2017) from Naval Postgraduate School wrote in his thesis: "while the use of drones for aerial surveillance may often be legal, it may not be acceptable to the public, and the police need the public's trust to serve them effectively".

Schwartz (2017) looked into ways to gain trust from the local community for the use of drones to support public safety. He tested the validity of "drone-specific recommendations of groups like the International Association of Chiefs of Police, American Civil Liberties Union, and Community Oriented Policing Office of the United States Department of Justice" (Schwartz, 2017). He concluded that when law enforcement agencies follow UAS (Unmanned Aerial System) adoption guidelines put forth by the ACLU, IACP, and USDOJ COPS Office, they are "more likely to succeed in creating an operational UAS program than those that ignore those guidelines" (Schwartz, 2017). Schwartz (2017) also mentioned how beneficial community engagement and partnerships are to overcoming concerns about privacy and abuses of power with drones.

All the technological advances with drones also mean that the police departments will be collecting an increasing amount of personal data from people in general. As "Electronic Frontier Foundation" (n.d.) states, some drones can "stay in the air ... for hours or days at a time, and their high-tech cameras can scan entire cities, or alternatively, zoom in and read a milk carton from 60,000 feet. They can also carry Wi-Fi crackers and fake cell phone towers that can determine your location or intercept your texts and phone calls." This already shows how advanced and invasive drones can be, not even including the addition of artificial intelligence or computer vision technology, which can make drones even more powerful and scary to the general public.

There are two prominent technologies for identification that can be used with drones to catalog individuals and their activities: facial recognition technology and license plate readers (Laperruque, Janovsky, 2018). Those technologies are already widely used in the government agencies and have established databases that contain nearly fifty percent of American adults (Laperruque, Janovsky, 2018). This means that with the addition of drones, law enforcement agencies will increasingly have the ability to identify and catalog people and sensitive activities. It will be easy to scan all the cars in different parking lots and come up with lists of attendees for certain meetings or activities (Laperruque, Janovsky, 2018). Some of these technologies are actually being used now, as shown by American Civil Liberties Union, exposing the fact that the FBI deployed “aerial surveillance to record the activities of protesters in Baltimore" (Electronic Frontier Foundation, n.d.).

Another concern in addition to the collection of identifying personal information by law enforcement agencies is the security of the personal information collected. The more data the government has of people, the more of a target the government database can become. Hackers can gain a significant, and increasing, amount of personal information, especially with the addition of drones, once they hack into the government databases. This means that the potential consequence for each leak increases as more personal information is stored.

User and Non-user

Sally Wyatt (2003) mentions in “Non-Users Also Matter: The Construction of Users and Non-Users of the Internet”, that "acknowledging the existence of non-users accentuates certain methodological problems for analyzing socio-technological change" and avoids traps that are "associated with following only the powerful actors". Although it is great that drones can help users, in this case police, to more efficiently maintain societal order and ensure the safety of the

people, the process can invade the people's/ nonusers' privacy. This can also unintentionally undermine the users'/ police forces' goal to serve the people of the United States, as you also intrude on people/ harm people psychologically during the process of attempting to protect the people.

However, besides the obvious use by police, criminals and terrorist may also use drones to aid in their mission, which is both dangerous and unregulated. To keep pace with both society and criminal technologies, police should have more authority over the public use of drones, to prevent criminals from using this technology in performing crimes.

Regulation

One way to balance the benefits of drones and the effect of privacy intrusion on the people is through regulation. Other new technology Fourth Amendment privacy issues such as GPS, thermal scanners, and smartphones have been slowly addressed by the Supreme Court with time, but they have not tackled the questions raised by drones yet (Feeney, 2016). However, there are new legislations being passed in states along with old existing legislations that generalize to cover drone use. In 2013, Florida, Idaho, Virginia, along with five other states passed the first ever drone-related legislation (McNeal, 2014).

Since facial recognition is an increasingly huge privacy concern, future drone legislations should, as Feeney (2016) says, limit the analysis of police drone footages with biometric software. Feeney (2016) suggests two conditions to be met before biometric software can be used: "1) that biometric software is used exclusively in violent crime investigations, and 2) that biometric databases only include information related to citizens with a violent crime conviction". I think those conditions would enable the police to still leverage advantages of drones, especially against serious criminals to protect public safety, without unnecessarily invading people's

privacy. Thermal scanning technology, Feeney (2016) suggests, should also be limited similarly. Although fortunately, the Supreme Court already "ruled in *Kyllo v. United States* (2001) that police officers cannot use thermal scanners to search houses without a warrant" (Feeney, 2016).

Feeney (2016) also suggested that drone footages that does not include an incident or investigation be deleted after 90 days, allowing police departments to free up storage space and give citizens time to seek legal advice on requesting drone footage. The retention legislation should be accompanied by laws that limit access to footages, in which references to existing body camera footage legislation may be helpful (Feeney, 2016).

I think the state should make an effort in educating the general public of their efforts in limiting drone use and analysis, just like the findings of Schwartz, so that people are more comfortable with police drones flying over their heads. It brings more comfort knowing that the drones will only collect enough information used for public safety, and that the data will not be retained for long. However, I do realize that this is only achievable when the public trusts in what the police says they will do. Lawmakers can help by mandating the police department in releasing information like the "kinds of drones they use, how many drones the department has, how often the drones were deployed, what kind of operations the drones were used for (searches, missing persons, etc.), and the total flight hours." (Feeney, 2016).

In addition, a new way that people can stay informed is through the use of sites like Atlas of Surveillance. Atlas of Surveillance database contains "several thousand data points on over 3,000 city and local police departments and sheriffs' offices nationwide", allowing "citizens, journalists, and academics to review details about the technologies police are deploying, and provides a resource to check what devices and systems have been purchased locally" (Electronic Frontier Foundation, 2020). This site is built through "crowdsourcing and data journalism",

which emphasizes the significance of the privacy concerns among citizens (Electronic Frontier Foundation, 2020). Sites like this not only help people stay informed, but also enables them to have concrete sources and basis to push forward regulations.

Conclusion

Throughout this research, I analyzed the benefits, concerns, foreseeable consequences, and possible resolutions and legislative actions associated with the police use of drones. In the end, I believe that utilizing drone technology will be beneficial to the citizens of the United States, which are the people that the police are trying to protect and serve. However, only under the condition that appropriate guidelines and adopted legislation are established. With appropriate legislations, citizens'/ non-users' privacy can be protected, and people can feel more comfortable adjusting to the increasing advancements in drone technologies.

References

Drone Surveillance - Why Use Drones For Security Surveillance. (2020, March 2). Retrieved from https://www.altiuas.com/drone-surveillance/

Electronic Frontier Foundation. (2020, July 13). EFF Launches Searchable Database of Police Agencies and the Tech Tools They Use to Spy on Communities. Retrieved from https://www.eff.org/press/releases/eff-launches-searchable-database-police-agencies-and-tech-tools-they-use-spy

Electronic Frontier Foundation. (n.d.). Surveillance Drones. Retrieved from https://www.eff.org/issues/surveillance-drones

Feeney, M. (2016). *Surveillance Takes Wing: Privacy in the Age of Police Drones*. CATO Institute. Retrieved from https://www.cato.org/sites/cato.org/files/pubs/pdf/pa807_1.pdf

Laperruque, J., & Janovsky, D. (2018). *These Police Drones are Watching You*. Project on Government Oversight. Retrieved from https://www.pogo.org/analysis/2018/09/these-police-drones-are-watching-you/

Marx, L. (1987, January). Does Improved Technology Mean Progress? *MIT Technology Review: January 1987*, 33–41.

McNeal, G. (2014). *Drones and aerial surveillance: Considerations for legislatures*. Brookings. Retrieved from https://www.brookings.edu/research/drones-and-aerial-surveillance-considerations-for-legislatures/#footnote-1

Rice, S. (2019, February 4). Eyes In The Sky: The Public Has Privacy Concerns About Drones. *Forbes*. Retrieved from https://www.forbes.com/sites/stephenrice1/2019/02/04/eyes-in-the-sky-the-public-has-privacy-concerns-about-drones/#5d27264e6984

Schwartz, S. C. (2017).

Wyatt, S. (2003). Non-users also matter: the construction of users and non-users of the internet. In *How users matter the co-construction of users and technology* (pp. 67–79). Cambridge, Massachusetts: MIT Press.