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Advances in Drone Technology Will Revolutionize Campus Security

Everyone is buzzing over the use of drones, but is your campus or district ready for the revolution?
By John Minor

There is a drone revolution underway. In the past year, drones have been one of the hottest topics for news outlets around the world. Media coverage varies wildly, ranging from how drones will save time, money and lives, to how drones will help grow a nation’s economy. There have also been plenty of concerns expressed over privacy and safety. What has been less explored, however, is how drones are revolutionizing security.

In the commercial context, the drone that is poised to revolutionize the security industry is not your “grandpa’s drone,” which was primarily an aerial target used by the military. Commercial drones incorporate a sophisticated network of systems, which consist of the aircraft, sensors, two-way communications and ground control stations. Let’s take a closer look at how and why this buzzworthy technology is making so much noise in the campus security community.

Check Out These Drone Articles on CampusSafetyMagazine.com
Drone Safety: Will Regulating Them Work?
Here are some possible drone regulations coming up and the problems the government will have with implementing them.

Video Recording of Drone Shooting Gun Raises Concerns
An 18-year-old’s video of his drone firing a gun has caused a public outcry and sparked investigations by local and federal agencies.

Understanding the Risks and Opportunities Presented by Drones
Police departments and private citizens must learn how to safely and appropriately operate unmanned aerial vehicles.

Chinese Schools to Use Drones to Catch Students Cheating
Chinese school officials are planning to deploy drones to identify students who use high-tech methods to cheat on the National College Entrance Exam.

Are Drones a Threat to Your Hospital?
Unmanned Aerial Vehicles are growing in popularity, and hospitals must be prepared to address as best they can the safety, security and privacy implications of these devices.

Univ. of Arkansas Bans Drones on Campus
A school official says the new policy is an attempt to protect students.

Additional Capabilities Extend Watch
Ground cameras — no matter how high-tech — are still limited by their design. If an intruder steps out of a camera’s field of vision, the camera essentially becomes useless. The same happens if a criminal sprays the camera dome with paint or puts a hood over it. This won’t be the case with airborne cameras (drones) that operate out-of-reach of criminals.

Without a doubt, drones will become a major part of future security and surveillance systems. Drones offer a fast-launching, easy-to-operate, portable and cheap replacement to manned aircraft as the “eye in the sky” for most campus security applications. They provide added capability that stationary cameras cannot provide. In fact, given the vast need for security on and around campuses, as well as in other markets, such applications will likely be among the top five uses for drones overall within the next five years.

Consider the security needs of universities and schools. The advantages for campus police and security departments using surveillance drones are clear: Drones can easily monitor wide swaths of hard-to-reach and high-risk locations, such as trails and parking lots, while also providing all first responders with...
real-time situational awareness during campus emergencies. Unlike fixed video surveillance systems, drones can be deployed at a moment’s notice to any location with no installation costs.

SENSORS AND VIDEO PROVIDE A POWERFUL TANDEM

Drone technology offers a much more comprehensive security surveillance system. A drone’s sensors are one of the most important (if not the most important part) of the system. Drone sensors provide the actual imagery that will be used for the chosen application; therefore choice of resolution is extremely important when choosing a sensor. The sensors can be traditional cameras or video systems, thermal infrared imaging systems, light detection and ranging systems (LIDAR), or a variety of other sensors designed for specific applications. For example, a drone carrying a thermal infrared sensor can easily spot a perimeter intruder at night by the heat they emit. The two-way communications are used to get the sensor video and other information to the ground control station and for command and control of the aircraft and sensor. But it is really all about the benefits that an airborne sensor streaming real-time video with a Drone Video System (DVS) can offer to campus public safety departments.

The sensors carried by the drones provide new ways of conducting business in a more efficient and cost-effective manner. In fact, in any industry where cameras were previously carried by helicopters or manned aircraft, drones with cameras can do the same job more effectively and cheaper. Collecting irrigation and pesticide data with remote control drones can save farmers significant time and money, for instance.

In fact, the Japanese farm industry has been using drones in this capacity for well over a decade. Law enforcement and first responders are now using drones to monitor dangerous situations in real-time. Fire battalion commanders are using drones to view entire firefighting scenes in order

**Potential Application: Student Safety Escorts**

Consider another way that drones could revolutionize campus security, but on a more personal level to the student, by using a technology that is sometimes called the “Uber-like” Drone. Imagine that you are a female student who is absorbed in your studies at a university library and have just heard the announcement that the library is closing in 15 minutes. It’s nighttime, and you are alone. You have no ride home, and you are concerned for your safety.

What if you could call up on-demand your own “Uber-Drone” to escort you, providing real-time video of your walk home? Once safely at your residence, the drone service is terminated and you pay a fee using your phone app, much like you would with an Uber-taxi.

San Francisco–based start-up GoFor is already providing this type of service. Drones are summoned much like taxis in other popular service apps. Your desired task is either noted at the outset using presets, or customized using voice commands. Once the drone arrives, your phone’s flashlight is used to pair your device with the drone.
Universities Consider Adoption of Drones

Imagine a gunman is reported on your campus, and a fleet of security drones responds. The drones then relay the exact location of the gunman, sending a live video feed to the security system’s command and control sector. Although this seems somewhat unbelievable, drone technology is progressing to this level of advancement.

Universities are pursuing the advance of this aerial robotic technology in their research laboratories and classrooms, and lately the emphasis has been shifting from military applications to public safety and security applications, as well as commercialization in a wide variety of markets.

Many universities have already begun adding drones to their security systems. The University of Alabama in Huntsville (UAH), for example, announced that it would be using drones to assist campus police in maintaining “a safe campus environment.” According to a statement by UAH Police Chief Michael Snellgrove, the department believes that the technology may be incredibly useful and offer a wide range of possible applications. Ultimately, their objective is to enhance their ability to make UAH even more secure.

SECURITY APPLICATIONS ABOUND

The security industry is a natural extension of drone video technology where surveillance drones can make a huge difference. In 2012, the Japanese company Secom announced the world’s first autonomous drone for private security. Since then, dozens of other security firms have jumped on the bandwagon, competing to offer their clients the very best high-tech protection possible.

The Secom drone can link with an intruder detection system that sends beams of laser light along the perimeter of a secure zone. When the detector senses motion, the drone automatically takes off from a nearby charging station to investigate. It sends real-time video of an intruder or vehicle (along with its license plate) to a security center for analysis. According to Secom’s Akihiko Takeuchi, the drone “won’t leave the company premises but it will record imagery of intruders leaving it.”

As technology improves, surveillance drones will likely patrol at-risk areas 24/7/365, acting both as a deterrent and a “set-and-forget” mechanism against break-ins.

Surveillance drones can and will be used for many other security applications. Consider these wide-ranging possible end users: banks, casinos, airports, ports, maritime, border patrol, transportation, government facilities, large stadiums and events, law enforcement, fire departments, neighborhood watch, home and ranching/livestock, industrial and power plants, high-tech firms and other corporations, college campuses, construction sites, prisons, post-natural disaster environments, endangered species and anti-poaching, sensitive product shipping, anti-pirating surveillance, criminal car tracking, crowd control, VIP security, offshore drill rigs and more.

Many of these applications are already underway. BP was the first company to obtain FAA approval to use drones to inspect the oil facilities in Alaska. The company uses remotely-controlled, 6-foot-long, fixed-wing Puma Aerovironment drones to conduct aerial surveys over BP’s Prudhoe Bay oil field on Alaska’s North Slope. Abu Dhabi and Gatwick, U.K., were the first to deploy drones to ensure onsite safety.

In Gatwick, “Skyranger” drones equipped with high-definition cameras take snapshots and forward them to officers using portable consoles up to half a kilometer away. In Abu Dhabi, drone cameras are being used to assess and monitor accidents, provide information during search-and-rescue situations and gather information about approaching vessels or ships with sensitive cargos.

Today, we are talking about a single drone or a few drones providing additional security when integrated with existing systems. Future possibilities, enabled by rapidly advancing robotic and autonomous technologies, are almost endless.

DRONES CAN PROTECT FIRST RESPONDERS

Drones can also protect law enforcement personnel trying to gather information on or respond to an active crime scene where suspects may have weapons or there is a bomb. Additionally, drones can be equipped with nonlethal weapons such as Tasers, tear gas and rubber bullets, further protecting first responders.

Imagine in the not-too-distant future when all security cameras and security guards are replaced by a swarm of flying drones that are on continuous patrol while recording video sent to an automated system to detect, identify and respond to an intruder. The technology of swarming drones is here today. Although not yet commercially available, it has been demonstrated in laboratory and field tests.

Implementing drone security technology increases the security veil while reducing expenses associated with the inefficiencies of on-the-ground security personnel. Drone security systems will save time, money and lives. The only question is, are you ready for the drone revolution?

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