

# Playing Defense Against the Drones

We've managed to create armies of flying robots. Can we control them?

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One sweltering tuesday this summer, I found myself standing on the vast aluminum roof of an East Coast government building, staring at a slim metal rod with a microphone and a metal box bolted to it. The contraption stared back, impassive as a Buckingham Palace guard. I took its picture. I wondered aloud whether we would all have something like it on our homes one day. It did not respond. It was listening for one specific threat, and that threat wasn't me.

From the outside, this appeared to be the most boring building in America: beige cement blocks surrounded by a lazy river of asphalt parking lots. But below my feet was a Homeland Security office, and its occupants were concerned about the ways terrorists or mischief makers might use small, off-the-shelf drones to conduct video surveillance or deliver unwanted packages.

The contraption, called DroneShield, was designed to detect the sound of an approaching drone and warn of its impending arrival. On this particular day, DroneShield's inventors, Brian Hearing and John Franklin, were demonstrating the device for a representative from the office. After they completed the installation, we climbed a ladder down to the ground. Their white polo shirts peppered with soot, they offered the client a cookie. (He declined.) Then they fired up a drone about the size of a biology textbook, and we all watched as it whirred effortlessly up, up, up into the sky.

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The drone, a white, four-propeller rig, emitted a buzzing hum—sort of like a hive of bees trapped in a mailbox. Comparing it against a library of common drone sounds, DroneShield correctly identified the model—a DJI Phantom—in about three seconds and dispatched a text-message alert that, if this hadn't been a drill, would have sent security guards running.

The client nodded. Then, mostly for dramatic effect, the DroneShield guys illustrated how one might capture such a drone with a net gun, a tool normally used to catch feral animals. While Franklin leveled the drone above us, Hearing charged the gun with a compressed-air cartridge, took aim, and fired. The net sprawled out on the grass, having missed its target. A second shot also failed. The drone hovered patiently, like a butler waiting on his drunken master. On the third try, the net swaddled the drone in mesh and brought it down to the ground, undamaged. We all cheered. It was strangely exhilarating to see the drone finally tangled in white threads. Man had triumphed over machine, for now. The DroneShield guys retired to Ruby Tuesday for beers.

To understand how grown men came to be lassoing robots out of the sky, consider what has happened in recent months: Everyone from Silicon Valley entrepreneurs to high-school kids have put nonmilitary drones to new, previously unimagined uses. Drones have delivered medicine to rural Virginia, monitored crops, and captured heart-stopping video footage that has appeared in movies you have probably seen.

The devices have also veered uncomfortably close to planes in U.S. airspace—more than 650 times in the first eight months of the year alone, nearly triple the number of encounters in all of 2014. One transported a vial of radioactive material onto the roof of the Japanese prime minister’s office. Three have flown near the White House, including one that crash-landed on the South Lawn, sending the Secret Service swarming. And across the globe, at gatherings ranging from triathlons to gay-pride parades, small drones have struck and injured more than a dozen innocent bystanders.

Drones are capable of wonderful, mundane, and terrible things. Ignore anyone who predicts a coming utopia or apocalypse. Flying robots are hard to stereotype. And while considering what drones will do is interesting, a more compelling question is what *we* will do about them: How will we manage the vaguely menacing marvels that we’ve built? Will we learn to tolerate the privacy invasions, just as we have surveillance cameras? Will we accept the occasional hit-and-run, as we do with cars? Having invented flying robots that can go places we’d rather not, how will we prevent them from going too far?

To glimpse the near future, I spent several months speaking with people who already live there, including security experts, a celebrity-wedding planner, an animal-rights activist, and a couple of prison wardens. In different ways, they are all reckoning with off-the-shelf drone technology in their everyday work. They’re responding faster than most government agencies, and their patched-together countermeasures are as imaginative as the drones themselves.

Future historians trying to identify the date that civilian drones went mainstream may look to January 7, 2013. That’s when DJI, a Chinese company, released its Phantom drone, for \$679. A sleek quadcopter that fit in a backpack, the Phantom was remarkably easy to use. It flew where you told it to fly, all while remaining stable enough to take great footage. Until that point, the only way to get a comparable device was to buy a professional rig for a small fortune or to build your own.

The same improvements that have transformed smartphones—better GPS units, accelerometers, and other sensors—have also revolutionized drones. Companies such as 3D Robotics and Parrot have released their own relatively cheap and easy-to-use models, as DJI’s revenue rocketed from an estimated \$25 million in 2012 to \$500 million in 2014 (a DJI representative declined to release official figures). Industry analysts estimate that more than 1 million small civilian drones are now in circulation worldwide, though accurate sales data are hard to come by. That number could double next year.

It’s not a coincidence, then, that the number of drone-related hijinks has also been on the rise. In August 2013, a drone crashed into a crowd at a bull run in Virginia. The next month, activists protesting the German government’s surveillance policies landed a drone on a dais in front of Chancellor Angela Merkel at a reelection-campaign event in Dresden. Over the past two years, people have attempted to use drones to smuggle contraband into more than a dozen prisons around the world.

This summer, a few drone users committed the ultimate faux pas: interfering with firefighters. California emergency personnel were forced to halt aerial wildfire-fighting operations at least five times due to worries that nearby drones might get sucked into jet engines or tangled up in helicopter propellers. (In truth, no one really knows whether a small drone could take down a plane, but no pilot is eager to find out. The Federal Aviation Administration has said that it will begin testing the impact of drones on plane engines and parts over the next year.)

Along the way, the public response to drones has begun to shift. Strangers have started to confront drone users, sometimes aggressively. After a DJI Phantom fell on a man named Scot Yount at a Memorial Day parade in Marblehead, Massachusetts, injuring him slightly, the crowd became hostile. The drone operator rushed over to apologize, and Yount accepted his apology. But others were not so forgiving. “Immediately, people were running over,” Yount told me, “predisposed to be angry.” One man started filming the contrite drone operator with his smartphone. Someone called the police and a local CBS affiliate. Soon paramedics and firefighters arrived. Within hours, the story was up on the Drudge Report.

For a while, Yount wondered whether he should have been more upset: Maybe the crowd’s reaction was rational, and he was wrong. But now he thinks the reaction represents a primal human response, one that goes beyond the actual threat. “There’s something about a drone,” he said, “that awakens something in our psyche that we don’t even know is there.”

In response to incidents like these, legislators in 26 states have passed laws limiting the use of drones. But some will not withstand judicial scrutiny. Under a sweeping new Florida law, for example, drone users who videotape people without their consent could be sued for financial damages—a rule that seems to conflict with a century of precedents protecting the news media’s right to collect images from public vantage points.

At the federal level, the FAA—the agency to which most drone regulation has fallen—has been slower than its international counterparts to regulate drone use in a coherent way, partly because the United States has a comparatively large and crowded airspace. So far, the agency has prohibited drones from flying below 18,000 feet anywhere near Ronald Reagan Washington National Airport, including all of the nation’s capital. In most of the rest of the country, people can legally fly drones for fun as long as the device weighs 55 pounds or less, remains within sight, flies below 400 feet, and stays away from people and airports. But 55 pounds is actually quite heavy, and probably more heft than you’d want a novice flying anywhere in your ZIP code. (The most-popular off-the-shelf drones, including DJI’s latest-model Phantom, weigh less than five pounds.) A bigger problem is that drone operators violate these rules every day, particularly the one about avoiding people and airports. And, because it is very hard for law enforcement to track down owners of rogue drones, the FAA hasn’t enforced the rules in any significant way.

Meanwhile, if Americans want to use drones for any kind of profit-generating activity, such as news-gathering or shooting professional wedding videos, they must first get an exemption from the FAA, and they must have a licensed aircraft pilot at the controls. In other words, there are nominal limits on amateurs using drones but strict limits on professionals, which seems odd. So far, the FAA has granted about 1,500 of these commercial waivers, which is less than the number of approvals granted by much smaller countries such as Japan, France, and Canada. The FAA has promised to finalize more-flexible and more-comprehensive commercial rules sometime in the next several months, but it has blown past similar deadlines before. For now, many professionals use drones in violation of the policy.

While regulators have been plodding along in their alternate reality, Sam's Club stores have been stocking up on a dozen different drone models for the holiday shopping season. An antiprostitution activist in Oklahoma has been using a drone to capture footage of johns and posting it online. And in July, a teenager in Connecticut weaponized his drone with a handgun and posted a chilling YouTube video of the device being fired remotely in the woods. It's not quite time to welcome our robot overlords, but things are getting weirder by the day. Anyone who wants to prevent drones from careening into his or her airspace has no choice but to get creative.

Just before 2 o'clock in the morning on the day after Easter last year, an officer at Lee Correctional Institution noticed what looked like a flying object in the black sky overhead. That was odd. A high-security prison in Bishopville, South Carolina, Lee does not get many unexpected visitors. The prison consists of 14 low-slung cement-block buildings ringed by two razor-wire fences and pine trees. Beyond that, farmland stretches as far as the eye can see. Most nights, the only moving objects are corrections officers' vehicles, slowly orbiting the prison on routine patrols.

The officer, who was in the prison's control room at the time, radioed a colleague on patrol and asked her to investigate. She couldn't locate the UFO, but she did see a human sprinting into the woods. After the sun rose, other officers spotted a taped-up bundle of cellphones, tobacco, and marijuana dangling from a power line next to the prison. In the nearby shrubbery, they found the getaway vehicle—a drone not unlike the one deployed for DroneShield's rooftop demo. Its operator had presumably lost control of the device around the time its payload got tangled in the power line.

When Bryan Stirling, the director of the South Carolina Department of Corrections, got the call about the drone incident, he was stunned. He'd only heard about drones in news stories on the military's unmanned strikes abroad or on Amazon's futuristic home-delivery schemes. But the more he thought about the incident, the more sense it made. South Carolina's corrections officers recover contraband almost 20 times a day across the state's two dozen prisons. Inmates have recruited friends and associates to pack pills into tennis balls and footballs and heave them over the fence. They have tried to smuggle in tattooing equipment, weapons, and whiskey. Near one prison, officers even discovered a potato cannon that had likely been used to launch projectiles over the fence. "People come to prison with a plethora of knowledge," Stirling told me. "It

makes sense they would use this technology.” If Amazon executives are testing out a clever new delivery scheme, you can be sure inmates are, too.

To enlist the public’s help in finding the perpetrators, South Carolina officials publicized the drone incident. In response, Stirling got calls from all manner of companies offering solutions to his drone problem. Some promised fantastic defenses, from laser guns to drone-hunting drones. Stirling was skeptical. “At this point, I’m not going to go with the shiniest ball,” he told me. “I want something proven, or I’m not comfortable spending taxpayer money.”

Unfortunately, there are no proven solutions. Not yet, anyway. Small drones are hard to stop. They can change direction at speeds rarely seen in nature. Jamming the radio signal of a drone (or cellphone or anything else) is illegal in the United States under long-standing federal law because, according to the Federal Communications Commission, it could prevent people in range from calling 911 in an emergency.

Shooting down drones is usually illegal too, even if the drone is above your property. William Merideth of Hillview, Kentucky, was arrested in July after shooting down an \$1,800 drone that was, he says, hovering over his daughters in the sky above his back deck. The anonymity of the drone was what spooked him. “We live in a society now where we don’t know what these people are doing,” Merideth told a local news station afterward. “We don’t know if they’re pedophiles looking for kids; we don’t know if they’re thieves. We don’t know if it’s ISIS.” The pilot of the drone said he was just trying out his new toy and did not intend to invade anyone’s privacy or, presumably, to establish an Islamic state.

Even if it were legal to shoot down a drone, it’s not an elegant solution if the drone then falls onto a crowd of people. And it’s not always easy to do—especially if the pilot is flying the drone erratically to avoid such a fate. Not only is it illegal to jam the signal of a drone, in other words, you also can’t easily shoot one down.

So what *can* you do? One product for sale, and I am not making this up, is a giant net that can surround a building in order to prevent all manner of incoming deliveries. A few prisons have installed this netting to prevent contraband from being thrown (or flown) in, and the solution has a certain Spider-Man appeal. But Bryan Stirling worried that it could create new problems—for example, offering inmates a handy way to climb off the grounds.

Still, he felt compelled to act. He knew from experience that if corrections officers discover a contraband-delivery strategy once or twice, it has been deployed many more times without anyone noticing. So, after considering his options—and South Carolina’s modest corrections budget—he decided to go with what he knew.

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Deterrence, Stirling concluded, is always the first line of defense. His investigators searched the woods and found what seemed to be a small campsite near where the drone had crashed. A discarded receipt led them to a nearby convenience store. There, they scanned security-camera footage and identified two suspects, both of whom were

subsequently arrested. One of them, Brenton Lee Doyle, has since been sentenced to 15 years for contraband smuggling and drug possession. (Neither Doyle nor his lawyer responded to requests for comment; the other suspect's case is pending.)

The possibility of a 15-year prison sentence would discourage some people; others would need a more immediate barrier. So Stirling fast-tracked a preexisting plan to build a pair of three-story watchtowers on Lee's perimeter, so officers could see incoming air traffic sooner. He also had thermal-imaging cameras installed for the night watch. Not all drones give off enough heat to be easily detected this way, but the humans operating them do. (Drones can be programmed to fly on autopilot, using GPS coordinates, but most users still find it easier to operate them by standing nearby with a joystick.)

South Carolina's other countermeasures are decidedly low-tech, Stirling explained as we cruised around Lee in his Crown Victoria last summer. "We try to keep the grass real short so people can't hide things," he said. Then there are the bees, he added, pointing to one of a couple dozen wooden beehives scattered around the grounds. Signs on the prison's perimeter warn would-be trespassers in yellow and red paint: Danger! Bees. Keep Out! The bees serve as an educational outlet for inmates interested in apiculture, Stirling said—but also as a disincentive for anyone thinking about launching care packages over the fence.

Finally, there are the rattlesnakes—a naturally occurring feature of the South Carolina brush. The prison leverages this asset with signs picturing a sinister-looking reptile above the words Rattlesnake restoration area! As Stirling put it: "We need a holistic approach." Drones are new and unpredictable, yes, but humans will always be afraid of snakes.

Most people flying drones are not trying to smuggle cellphones to prisoners, of course. They are your friendly neighborhood geeks, hobbyists, and videographers, using the drones to take sweeping aerial footage for fun or for work. When they violate existing rules, it's usually because they don't know that the rules exist.

Last year, 31 drones were flown near Major League Baseball stadiums. In virtually every case, the drone was piloted by a hobbyist who just wanted to capture the magic on video. This September, a drone flown by a science teacher crashed into an empty section of seats at a U.S. Open tennis match, causing a brief delay in play.

The NFL counted 12 drones near stadiums on game days last season. "It's like the Wild West out there," says Jeffrey Miller, the NFL's chief security officer. "People aren't aware of the regulations." Drones, like all manner of aircraft, are not supposed to fly over stadiums full of people, because someone could get hurt if something goes wrong. Most off-the-shelf drones cannot easily carry anything heavy, so a mass-casualty terrorist attack is less likely than an accidental crash. "Right now," Miller says, "the biggest threat is a hobbyist who just wants to take a photo and loses control."

Major League Baseball, in conjunction with federal officials, experimented with a drone-detecting radar system at the All-Star Game in Minneapolis last year. The system swept the crowd of 40,000 people in search of rogue aircraft and spotted at

least one drone. But it reportedly cost several hundred thousand dollars for just one night of use. “It’s a rather expensive proposition,” says John Skinner, the director of security for MLB. “It does work, but it requires a lot of equipment.”

For now, league security officials have concluded that one of the best ways to detect drones is simply to deputize the crowd. When it comes to spotting small drones, 80,000 eyeballs are better than radar. Through text messages, signs, scoreboard announcements, and any other available platform, officials can remind fans to be on alert. Now when fans see someone in the parking lot pull out a drone to fly above the stadium, they are quick to alert security. Of course, stopping the drone is a complicated proposition, but once it has been detected, officials can use security cameras to help locate the operator and evacuate fans seated nearby if need be. “The best we can do for now,” Skinner says, “is educate the public.”

One of the many ironies of the drone debate is that the people most worried about drones use them in their own work. The FAA has investigated several NFL teams for using small drones to film their practices without first obtaining an exemption for commercial drone use. Firefighters are using drones to track wildfires. Gavin de Becker, who runs a private-security firm, is profoundly concerned about paparazzi and stalkers using drones to watch or even attack the politicians, celebrities, and other prominent figures his firm serves. His clients have already experienced at least a dozen drone incursions on their properties. Still, de Becker’s company has itself been using drones for the past two years—for example, to investigate sensor alerts on large estates and send back instant images. Within a year, he predicts, “they will be a regular feature at protected premises.” Given the obvious benefits, de Becker says, “it’s hard to say, ‘All right, we’ll just regulate this away.’ ”

Drones have the potential to help and to harass, and the race is on to see which narrative will prevail. Considering the complexity, even if regulators devise better rules and communicate them widely, not everyone will agree that they are the right ones. Which means there will be another guaranteed way that Americans will manage drones. As sure as the national anthem plays before a baseball game, we will do what we have always done when life gets complicated: We will sue each other.

For more than a century, the Philadelphia Gun Club has hosted pigeon shoots along the banks of the Delaware River in Bensalem, Pennsylvania. Ernest Hemingway was a member, and Annie Oakley visited with Buffalo Bill Cody. About five years ago, the club’s members encountered a new kind of airborne species. Between bursts of bird shot at their occasional live-pigeon shoots, they noticed drones hovering above them in the smoke-swirled sky. The machines had eight propellers, which meant they were exceptionally stable, and they carried cameras with high-powered lenses. The resulting footage was posted online by an animal-rights group known as shark (Showing Animals Respect and Kindness), whose members hoped to publicly shame the gun-club members.

In the past, a fence around the club’s estate had offered some privacy. Then, in 2009, shark set up tall tripods and filmed over the fence. The club reacted by building



a much higher barrier, roughly three stories tall. That's when shark unleashed the drones. "It's like an arms race," Steve Hindi, the president of shark, told me. "That's the game we have to play because they try to hide."

Another club shark targeted went so far as to build a landing pad for helicopters, apparently hoping to ground the drones by exploiting the FAA requirement that drones avoid airports. (The club did not respond to multiple requests for comment.) Soon after the helipad appeared, Hindi got a call from the FAA asking about his activities. But Hindi knew the rules; the FAA requires drone users to notify an airport or control tower before flying within a five-mile radius. So, Hindi explained, he always called the club before flying. "You're supposed to call. And we do," Hindi said. "We get an answering machine." He has never seen a helicopter landing at the helipad.

Naturally, some hunters shark has targeted have tried to shoot the activists' drones out of the sky. So far, the drones have been hit about four times, Hindi said, but only one has been lost. The Philadelphia Gun Club is trying a different tactic, suing shark and Hindi for invasion of privacy and for interfering with its shoots, among other claims. A representative of the club referred my questions to its attorney, Sean Corr. "It is a stress which is very difficult to live with on a long-term basis," Corr said, calling the drones "eerie." Beyond his clients' concerns, he wondered what the rise in drones portends for the public at large. "At what point do we say that a person has a right to be left alone?"

For his part, Hindi insisted that his drones do not interfere with shoots or infringe on the club members' privacy. But the lawsuit has been harder to repel than gunshots. His drone flights have become less frequent in recent months, partly because he has less money to travel from his home in Illinois to Pennsylvania. Much of his budget is going to lawyers. "Their vengeance is the lawsuit," he said, "and they're just bleeding us."

Eventually, humans will invent better ways to counter drones—more precise than litigation and more certain than deterrence. In the early 1900s, it's worth remembering, motorists did not have to bother with stop signs or driver's licenses. That didn't last long. nasa, in collaboration with the FAA, is now working with various universities and companies, including Google and Verizon, to design an air-traffic-control system just for drones—one that would have its own equivalent of roads, traffic lights, and Do Not Enter signs. Other researchers are working on technology to help drones sense and avoid obstacles in their way.

The U.S. Department of Transportation is considering whether the FAA has the authority to require drone users to register their devices when they buy them. To deal with the small number of criminal-minded drone users who will likely ignore all these efforts, some start-ups are developing drone-hunting drones—machines that could be sent into the sky to net or otherwise disrupt fellow drones. And engineers are developing methods of hacking into rogue drones and taking control, a sort of cyberjacking that would prevent the devices from falling on people below or releasing whatever questionable payload they might be carrying.

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This summer, at a high-end wedding in the Hamptons, an event planner named JoAnn Gregoli noticed a drone approaching over the water. Most of her weddings now use drones to film the proceedings, so she asked her videographer whether the device was his. When he said no, she began to panic, fearing paparazzi. “You could see the camera on it,” she said. “It was hovering over the ceremony. You could hear the whine.” So she ordered her videographer to send up his own drone and maneuver it between the rogue device and the wedding party below, hoping to block the camera’s shot. Soon afterward, the unknown drone flew off, and Gregoli has yet to see any images of the event in the tabloids. At future high-profile events, she plans to position a lookout to scan the sky for drones—with a counterdrone on standby just in case.

In a perfect world, common sense would be built into every drone. For an early glimpse of what that might look like, I went with Jon Resnick, the policy representative for DJI, the Chinese drone company, on a field trip to the border between drone and no-drone airspace outside of Washington, D.C.

Before joining DJI in January, Resnick spent two decades working as a TV-news producer for Reuters and then the Associated Press. He still talks (and smokes) more like a newsman than a businessman. We drove in his Nissan convertible to a large, grassy field next to a church in Oakton, Virginia, and he took a Phantom out of his trunk. He’d just come from a meeting on Capitol Hill in which he’d had to repeatedly defend drones, and he was still making the case. “See, he’s a happy guy!” he said, holding the device up to me. “He even has a name,” he added, pointing at the label on its case, which read Costello. Abbott, another of his drones, was at home.

Resnick started learning about drones two and a half years ago, to find ways for the Associated Press to get better, cheaper footage. At the time, his camera crews had to use a helicopter to get certain shots: “I’d put a \$5,000 line item in the budget and wait for my boss to yell at me.” But soon after he bought his office’s first drone, he realized that the FAA’s policies on commercial flying would make it extremely difficult for news organizations to legally use drones. “I started out just wanting to take cool pictures,” Resnick said, “and I was sitting in meetings with the FAA, frustrated.” When DJI came calling, it seemed like a good opportunity to get off the sidelines and enter the policy fray.

On Resnick’s third day at DJI, he got a call from his boss in Hong Kong. A Phantom had landed on the White House lawn, and Resnick needed to go on CNN to explain what the company was doing about it. Within a couple of days, DJI announced that it had upgraded its software to prevent its drones from flying anywhere within the D.C. no-fly zone. The tool, called geofencing, uses GPS coordinates to create virtual boundaries that drones cannot cross.

Other drone manufacturers have resisted this approach so far. But for the past year, DJI has used geofencing to prevent its drones from flying over sensitive locations all around the world, including, as you might expect from a Chinese company, Tiananmen

Square and the rest of Beijing. The system sends a message to a user's control panel when the drone approaches a sensitive area, and stops the drone from flying farther when it reaches a no-fly location. "We are very cognizant," Resnick told me, "of the potential for our stuff to be used for bad purposes."

To experience the magic of geofencing, I first flew Resnick's drone around in unrestricted airspace, whipping it up and down and back and forth over the field. I waved to the camera and saw an image of myself from above projected on an iPad. "Now go over there," Resnick said, pointing eastward, toward D.C. The drone buzzed off as directed, flying merrily for about 50 yards. Then it reared up slightly and hovered, as if it had run into an invisible wall. I pushed the joystick again, but the drone would not fly any farther. It hovered patiently, awaiting further instruction but refusing to break the rules, as prim as a flying C-3PO.

"You can't legislate away stupid," Resnick likes to say. But you might be able to innovate it away, at least some of the time. Pre-engineered safeguards will undoubtedly become part of a broader solution, raising all manner of intriguing questions about what should—and should not—be geofenced, and who gets to decide. Right now, the DJI geofencing database contains more than 10,000 restricted sites, most of which are airports. But who's to say prisons should not be included? And what about Jennifer Aniston's mansion in Bel Air? The list could get very long, very soon.

Moreover, geofencing is not a robust enough solution for the Secret Service or for airports. For one thing, if you choose not to upgrade the software on your drone, it will still fly wherever you'd like it to go without the latest geofencing updates. (So far, DJI does not ground, or "brick," devices that have not been upgraded.) Besides, advanced users can find ways to override geofencing by hacking into the software. And about half the drones on the market don't come with automatic geofencing at all. (That may change as the backlash grows. Senator Chuck Schumer has promised to introduce a proposal this fall that would require all consumer-drone companies to use geofencing.)

For now, every drone flight represents a sort of unmanned psychological experiment, testing the boundaries of our comfort and our imagination. We may eventually become desensitized to the machines we have built, especially if they become more useful to more people. Until then, we will go with our guts, for better and for worse.

After we'd been flying Costello for a few minutes, a car pulled up beside us. A man got out and walked over with a smile, introducing himself as the pastor of the church on whose field we were standing. "Drone?" he asked, eyebrows raised, hands in his pockets. We nodded, and Resnick offered to send him a photo of the church taken from above. The pastor politely declined. He urged us to stay as long as we liked that day. Then, ever so gently, he asked us to please not come back in the future, alluding vaguely to liability concerns.

### **About the Author**

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