This egg-shaped security robot is now roaming hospitals

Hospital lobbies are an odd place to spend an afternoon. At any moment, the air hangs thick with collective anxiety and anticipation. It’s also incredibly busy. Clipboard-carrying healthcare workers in blue and purple smocks speed-walk their way through a maze of hallways at all hours of the day, narrowly weaving their way past confused visitors in desperate need of direction. But humans aren’t the only ones roaming the floor. Increasingly, these miniature medical cities are being constantly monitored by a four-foot-tall, egg-shaped fully-autonomous robot.   
I sat watching one of these machines, a Knightscope K3 robot—which looks like a royalty free AI-interpretation of Star Wars’ R2D2—while polishing off a bag of chips at Houston Methodist’s downstairs lobby. Nine floors above me, one of my family members was fighting for his life, but in that moment I was distracted by an odd arcade-game-like humming sound emanating out of the white body and block-topped roaming robot. The K3 unit, which I would later learn was one of two units deployed in the hospital named “Watson and Holmes,” slowly drove itself across the lobby’s first floor, a panel of blue lights shining in its frontand a camera that resembled an eye. It maneuvers itself around an older man carefully striking calming notes on a grand piano before eventually returning the way it came and docks itself in a charging unit. These robots would become a familiar constant in the months to follow.   
Knightscope is one of many security companies vying to place the self-driving security robots in just about any large open space imaginable. These machines, which act as a kind of mobile security camera, are already being deployed in malls, parking lots, government facilities, and sports stadiums across the world. They have also become a staple in hospitals and healthcare settings which have their own unique threats and must constantly strike a balance between security and open door accessibility.   
The K3 robot comes equipped with live video recording capabilities and thermal cameras. Credit: Knightscope   
Robots are additional eyes and ears for public safety officers   
Knightscope Chief Client Officer Stacy Stephens, who previously spent years in law enforcement, told Popular Science he co-founded the company in 2013 in part as a response to the shock of the Sandy Hook elementary school shooting that claimed the lives of 20 children and seven adults. Stephens speculates the robot could be the “eyes and ears” needed to help first responders act faster and safer. In theory, Stephens said, a robot could cut down on the amount of time officers spend standing outside a room with a gunman on the other side.    
“We don’t know anything about the bad guy. We don’t know how they are armed, how much ammunition they have, or what other types of devices they may or may not have,” Stephens said. “At this stage of the game, the bad guy has a tactical advantage.”   
That vision led to the creation of the K3 autonomous robot.   
The unit, which is currently being deployed by security professionals in health care, law enforcement, and beyond, weighs in at 340 pounds and is about the height of a young teen. It features 360 degree eye-level video streaming and recording, thermal detection, a two-way voice intercom, and an emergency distress call button. Holmes, Watson and the rest of Knightscope’s models of robots aren’t capable of offensive maneuvers, so don’t expect to see them firing a gun or wielding a baton anytime soon. Instead, Stephens says they are intended to function as a “carrier device for sensors,” or essentially a camera on wheels. Public safety teams can use the roaming robots as a kind of additional mobile security camera which can “deter, detect, and report” suspicious behavior.  
Critics, however, worry robots like this amount to a mobile surveillance unit that could result in already over-policed groups being exposed to additional layers of monitoring and scrutiny. It’s also unclear how the majority of non-dangerous pedestrians caught in the robot’s path will even adjust to their new neighbor, especially if it’s one day upgraded to have more advanced analysis tools like facial recognition.     
Healthcare sectors have unique security threats that make robots appealing   
Though Knightscope isn’t strictly focused on working with hospitals, Stephens says they present unique security challenges that make roaming egg-shaped patrol bots more enticing. By nature and necessity, hospitals are easy to enter and accessible 24/7. That accessibly is crucial for patients in the midst of an emergency, but Stephens says it can also make facilities easy targets for domestic abusers looking to target victims or other bad actors who may want to do harm to health care professionals. In extreme cases, gang members have even entered hospitals and tried to carry out attacks against rivals. These scenarios are rare, but not unheard of. In general, Stephens said hospitals can quickly turn into a “very, very hostile environment.”   
My experience of late evening cigarette breaks and midnight strolls alongside Watson and Holmes proved less theatrical. Aside from what seemed like the occasional unhoused person pacing on the street adjacent the hospital entrance, the typical population wandering around the hospital’s first and second floor lobby were a mix of visibly disheveled family members, arguably even more tired looking healthcare workers, and confidant doctors draped in pristine white coats grabbing a vending machine snack. More often than not, I typically saw the two robots docked in their charging ports, laying dormant, only an odd electric-car like artificial hum leaving any hint they were active.  
Methodist wasn’t the first hospital to test out Knightscope robots—that title goes to an unnamed healthcare provider in California—but they were a relatively early adopter in 2018. Elhadji Sarr, Methodist’s Chief Public Safety Officer, told Popular Science they were interested in mobile robots as a way to help security staff cover more ground in the hospital’s sprawling campus. They ultimately settled on Knightscope due to the robot’s ability to traverse pre-programmed routes autonomously. Sarr says his security team spent around a day digitally mapping out the two floors where the robots would patrol. In most cases, the primary purpose of these sentry bots are to spot individuals entering into areas that are geo-fenced or considered off limits. The videos recorded by the robots are reviewed live or later by a security officer.   
“It’s a live view where we can see what the robots see,” Sarr said.   
In the six years since Methodist first introduced the robots, Sarr says they have reviewed footage that has shown multiple people in areas where they weren’t authorized. Though Sarr was light on specifics, Stephens claims the previously mentioned healthcare provider in California saw similar success. Stephens claims that the healthcare system averaged two security incidents per week prior to introducing the robots. Incidents, in this parlance, can run the gambit from vehicle break-ins and criminal mischief to assault and much in between. After one year with the robots, the average incidents per week allegedly dropped from two to zero. That client is still using Knightscope’s robots seven years later.   
“In my mind, that kind of validates the success of the program,” Stephens said. Outside of hospitals, Knightscope robots are also currently patrolling pharmaceutical manufacturing facilities and bioengineering sites.   
Privacy advocates worry facial recognition included future mobile robots could lead to disproportionate monitoring of certain groups. Credit: Knightscope   
Robot makers use sci-fi tinged stereotypes to their advantage  
But if these slow moving, goofy-looking eggs aren’t capable of attacking intruders, it’s not immediately clear why they would be any more effective of a deterrent device than a typical security camera. When asked about this seeming contradiction, Stephens attributed part of the robots’ apparent successes to “preconceived notions” and stereotypes the general public have come to associate with sci-fi-esque surveillance machines.   
In one example, which Stephens claims occurred at a non-healthcare related facility, an intruder entering a parking lot facility they did not have access to used their vehicle to ram into and destroy one of the Knightscope robots. It was later learned, through the driver’s attorney, that he intentionally collided with the robot because he assumed it had already surreptitiously collected his phone data and text messages and had targeted him with facial recognition. The driver was eventually convicted of three felonies, one of which for destroying the robot.   
“Whether it is or isn’t [collecting that type of data] is immaterial,” Stephens said. “At the end of the day, he attacked a robot and not a human to which I am incredibly grateful.”   
That leaning on preconceived notions about robots’ capability can cut both ways though. In my limited experience at Methodist, both visitors and several staff working at the hospital expressed concerns over the “creepiness” factor associated with the Robocop invoking machines. Sarr, the Methodist Public Safety Officer, said he didn’t think the robots generally elicited that discomfort and instead believed they were “welcomed” by the community.   
Sarr attributed part of that perceived acceptance to the safety team’s effort to show off the robots early and explain their functionality to hospital workers, an outreach effort that included a completion to name the two robots. Staff members, Sarr added, can sometimes be seen taking selfies with the robots, a not uncommon occurrence that also happened during the brief trial of Knightscope robots in New York City’s subway system earlier this year. That trial only lasted six months and resulted in the robot becoming the butt of online jokes and memes, especially after it was seen tucked away in an empty storefront surrounded by cardboard boxes. The New York Police Department has not publicly released data showing whether or not the robot led to reductions in crime.   
[ Related: NYPD retires big, egg-shaped subway surveillance robot—for now ]  
“You have to communicate and you have to inform them and once they know what these robots are, they will welcome them more,” Sarr said.   
Robots can quickly raise privacy alarms  
But there are still genuine privacy concerns closely linked to these robots, both in hospital settings and elsewhere. Advocacy groups including the Electronic Frontier Foundation and The Surveillance Technology Oversight Project have criticized law enforcement’s increased use of autonomous robots and drones in recent years due to their alleged ability to increase potentially unnecessary surveillance on highly policed, low-income or non-white communities. Advocates also worry robot manufacturers could equip these devices with facial recognition software, which research has shown is less accurate at identifying non-white individuals. At least seven Americans have been wrongly arrested because of a faulty facial recognition match.   
Stephens told Popular Science that the K3 robot in particular does not currently use facial recognition, but he didn’t rule out the possibility of adding it long-term. Though Knightscope does already use facial recognition in one of its larger, stationary security robots, they have so far held off deploying the tech in mobile robots due to notable decrease in accuracy when a robot is in motion. In this scenario, lighting sources are less consistent and subjects are rarely standing stationary in the perfect frame of a camera. Those, and other variables, lead to a blurrier, less clear image, both of which can decrease the effectiveness of a facial recognition search.  
“As the technology continues to develop and get better and AI starts to come in a little bit more in play in the space, then that [facial recognition] will ultimately be a capability,” Stephens said. “It just is not there yet.”   
Critics have also worried about the prospect of AI-enabled robotics one day making some security jobs performed by humans obsolete. At Methodist in Houston, Sarr says the K3 robots are intended to “enhance” the work of security professionals rather than offer a full replacement. Stephens, by contrast, said he believes there are “many, many cases” where robots like the ones Knightscope makes could completely replace a human but said healthcare likely isn’t one of those areas. Instead, robots like Watson and Holmes, who dutifully drone their way through quiet weekend nights unfettered, will likely continue to serve as an “augmentation” and additional layer of security.   
And regardless of their tangible effectiveness at fighting crime, these robots have inadvertently also become a kind of healthcare mascot. Leaving the hospital earlier this month to begin writing this story I stopped to get one more glimpse of Watson only to find myself split-stepping out of the way of a random person’s selfie.   
  
  
  
  
  
  
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