No. 19-1582, 19-1583, 19-1625, 19-1626

IN THE UNITED STATES COURT OF APPEALS
FOR THE FIRST CIRCUIT

Nos. 19-1582, 19-1625

UNITED STATES OF AMERICA
Appellant

v.

NIA MOORE-BUSH, A/K/A NIA DINZEY
Appellee

Nos. 19-1583, 19-1626

UNITED STATES OF AMERICA
Appellant

v.

DAPHNE MOORE
Appellee

On Appeal from the United States District Court for the
District of Massachusetts

Case No. 3:18-30001-WGY
Honorable William G. Young, District Court Judge

BRIEF OF THE CENTER FOR DEMOCRACY & TECHNOLOGY AS *AMICUS CURIAE* IN SUPPORT OF APPELLEES

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STATEMENT OF INTEREST[1]

The Center for Democracy & Technology (CDT) is a nonprofit public interest organization which seeks to ensure that the human rights we enjoy in the physical world are realized in the digital world. Integral to this work is CDT's representation of the public's interest in protecting individuals from abuses of new technologies that threaten the constitutional and democratic values of privacy and free expression.

In particular, for twenty-five years, CDT has advocated in support of laws and policies that protect individuals from unconstitutional government surveillance. This case has profound ramifications that reach far beyond the specific technology at issue, and that threaten the ability to associate, repose, and retreat into one's home.

[1] This brief is filed with the consent of all parties. Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(E), *amicus curiae* certifies that no party's counsel authored this brief in whole or in part, no party or party's counsel contributed money that was intended to fund preparing or submitting this brief, and no person—other than *amicus curiae*, their members, or their counsel—contributed money that was intended to fund preparing or submitting this brief.

INTRODUCTION

"Every man's house is his castle." *Weeks v. United States*, 232 U.S. 383, 390 (1914). This maxim traces its heritage back to English common law, which recognized that the law has "so particular and tender a regard to the immunity of a man's house that it stiles [sic] it his castle, and will never suffer it to be violated with impunity." 4 William Blackstone, *Commentaries on the Laws of England* 223 (1769). From America's earliest days, the paramount importance of the privacy of the home has been enshrined in the Fourth Amendment. Indeed, the Supreme Court has recognized that "the Fourth Amendment was the founding generation's response to the reviled 'general warrants' and 'writs of assistance' of the colonial era, which allowed British officers to rummage through homes in an unrestrained search for evidence of criminal activity." *Riley v. California*, 573 U.S. 373, 403 (2014).

In the modern era, the bedrock protection afforded the home by the Fourth Amendment is constantly being tested by ever-changing and evolving technology—from thermal imaging devices to cell phones and facial recognition software. Without the vigilant enforcement of Fourth Amendment rights, these advances will "leave the homeowner at the mercy of advancing technology." *Kyllo v. United States*, 533 U.S. 27, 35–36 (2001).

This case raises the question of whether the longstanding protection afforded the home under the Fourth Amendment will give way to persistent government video surveillance without the protections of a search warrant. For a period of approximately eight months, the Government, without a warrant, used a camera mounted to a utility pole to monitor and record every second of every move of every person outside the home of defendant Nia Moore-Bush's mother, co-defendant Daphne Moore (where Ms. Moore-Bush and her husband were living). In a distant office, far from the home's quiet residential street, law enforcement officers were able to remotely pan, tilt, and zoom the camera in and out in a way that was undetectable to those standing near the home itself. There was no need to continuously monitor the camera; the officers could review the recorded footage at their convenience.

As the district court correctly held, the Supreme Court's recent decision in *Carpenter v. United States*, 138 S. Ct. 2206 (2018), compels the conclusion that the Government's eight-month warrantless surveillance operation in this case violates the Fourth Amendment. People reasonably expect that the government will not amass a vast searchable video database of their domestic comings and goings, twenty-four hours a day, month after month. This reasonable expectation of privacy is not vitiated by the fact that the pole camera recorded only the publicly-viewable exterior of the house, just as the reasonable expectation of

privacy in the location information at issue in *Carpenter* was not defeated because the data reflected the defendant's public movements.

Even setting aside the manifest similarity between this case and *Carpenter*, there are other reasons the Fourth Amendment required a warrant here. Not only does this case involve the home—where the reasonable expectation of privacy is at its zenith—it also involves a technology that is subject to abuse in profound ways that are not yet fully developed and understood. For example, the government could apply facial recognition technology to its pole camera video database, gleaning new, highly-sensitive information from the voluminous data that has already been collected. It could also harness artificial intelligence to support video analytics, such as license plate or individual recognition. Indeed, armed with a favorable ruling in this case, nothing would stop the Government from unilaterally—and without any court oversight—building such a database by placing a pole camera outside the home of every person, whether the subject of a criminal investigation or not. The Fourth Amendment does not tolerate such an unbridled intrusion into the sanctity of our homes, and neither should this Court.

ARGUMENT

I. The Government's Persistent Surveillance of Defendants' Movements Outside and Surrounding Their Home is a Search Under the Fourth Amendment.

A. The Government's Eight-Month Surveillance Operation Contravened Defendants' Reasonable Expectations of Privacy in the Whole of Their Physical Movements.

For more than fifty years, the Supreme Court has held that the Fourth Amendment protects against government activity that intrudes upon a person's "reasonable expectation of privacy." *United States v. Bain*, 874 F.3d 1, 12 (1st Cir. 2017) (quoting *Katz v. United States*, 389 U.S. 347, 351 (1967)). Specifically, the Amendment affords constitutional protection to circumstances in which a person has "exhibited an actual, subjective expectation of privacy" and that "subjective expectation of privacy is one that society is prepared to recognize as objectively reasonable." *United States v. Morel*, 922 F.3d 1, 8 (1st Cir. 2019) (internal quotations and citation omitted); *see also Katz*, 389 U.S. at 361 (Harlan, J., concurring).

In *Carpenter*, the Court applied this familiar Fourth Amendment analysis to the acquisition of a defendant's location history collected over a period of several days via cell-site location information ("CSLI") created by the operation of his phone communicating with radio antennae called cell sites. *See* 138 S. Ct. at 2211—12. The Court held that the Fourth Amendment protected the location data

at issue, recognizing that the multi-day tracking of a person's movements "provides an intimate window into a person's life, revealing not only his particular movements, but through them his familiar, political, professional, religious, and sexual associations." *Id.* at 2217 (internal quotations omitted). The Court explained that while law enforcement historically had the power to "tail" suspects in public without a warrant, the collection of CSLI produces an indelible log of the whole of a person's movements that allows law enforcement to "travel back in time to retrace a person's whereabouts." *Id*. at 2218. Accordingly, notwithstanding the fact that the defendant's movements were tracked as he moved in public, the Fourth Amendment protected the data at issue because it captured an ephemeral yet inherently personal aspect of the defendant's life. *See id.* at 2217 ("A person does not surrender all Fourth Amendment protection by venturing into the public sphere.").

In reaching these conclusions, the Court relied on its earlier decision in *United States v. Jones*, 565 U.S. 400 (2012), in which a majority of the Justices agreed that the use of a GPS tracking device to remotely monitor a vehicle's movements over a period of twenty-eight days without a warrant had violated the defendant's reasonable expectation of privacy. As in *Carpenter*, several of the Justices recognized in *Jones* that the surveillance at issue violated the defendant's reasonable expectation of privacy because of its protracted nature, which intruded

upon the reasonable expectation of privacy in the whole of a person's movements, even across public spaces. *See* 565 U.S. at 430 (Alito, J., concurring) ("[R]elatively short-term monitoring of a person's movement on public streets accords with expectations of privacy that our society has recognized as reasonable. But the use of longer-term GPS monitoring in investigations of most offenses impinges on expectations of privacy."); *see also id.* at 415 (Sotomayor, J., concurring).

This case involves precisely the same concerns that animated the Supreme Court in *Carpenter* and *Jones*; if anything, those concerns are exacerbated here in light of the nature of the technology at issue and the robustness of the information captured. Here, as in those cases, the Government conducted a lengthy surveillance operation that monitored a person's physical movements. Indeed, the duration of the surveillance in this case (more than 240 days) is significantly longer than in either *Carpenter* or *Jones*. *See Carpenter*, 138 S. Ct. at 2217 n.3 (seven days' worth of CSLI data); *Jones*, 565 U.S. at 400 (twenty-eight days' worth of GPS tracking of a vehicle). Additionally, the pole camera here affords a robust depiction of the defendants' activities—permanently captured on video footage—and not merely inferences drawn about those activities from the location of the person over time.

As Justice Sotomayor recognized in her *Jones* concurrence, and as the Court later embraced in *Carpenter*, this type of sustained surveillance can reveal "a wealth of detail about [a person's] familial, political, professional, religious, and sexual associations." *Jones*, 565 U.S. at 415 (Sotomayor, J., concurring); *see Carpenter*, 138 S. Ct. at 2217. Over the course of eight months, a pole camera trained at a home would monitor moment-to-moment activities at a person's home; items they bring into and out of their home; packages left on their front stoop; their visitors; their activities around the house; and the clothing they choose to wear. Repeated departures at a certain time may indicate a pattern of religious observance, political expression, family gatherings, or community involvement.

As the district court correctly recognized, the Fourth Amendment concerns in this case are multiplied because the pole camera video was recorded, giving the Government the ability to search through the digitized recordings of the defendants' activities and enabling the Government to discern information that would otherwise be unavailable without burdensome human surveillance and cumbersome, intricate manual recordkeeping. *See United States v. Moore-Bush*, 2019 WL 2341182, at *1 (D. Mass. June 3, 2019). Because of the reviewable nature of the aggregated video footage, the information collected by the pole camera pointed at the defendants' home was of the same "detailed, encyclopedic" nature, and with the same "retrospective quality" that enabled law enforcement to

"travel back in time" to retrace defendants' whereabouts in *Carpenter*. 138 S. Ct. at 2216, 2218.

Notwithstanding these manifest similarities among this case, *Carpenter*, and *Jones*, the Government argues that this case is different because pole cameras only capture a "small portion of a person's movements." Gov't Br. at 22. Yet, as discussed above, the "portion of a person's movements" captured by their comings and goings from their house are rich with meaning, revealing a wealth of information about their identity, associations, and activities. Just as monitoring a car for twenty-eight day period provides an intimate portrait of the driver even though she does not spend every moment in her vehicle, *see Jones*, 565 U.S. at 400, so too does the monitoring at issue here intrude upon a reasonable expectation of privacy, even though the defendants were not under video surveillance every moment of every day.[2] Indeed, the video footage captured may offer a more robust—and therefore more intimate—portrait of her private life.

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[2] As the district court correctly held, this Court's decision in *United States v. Bucci*, 582 F.3d 108, 116 (1st Cir. 2009), cannot be reconciled with *Jones* and *Carpenter* and accordingly does not control here. The fulcrum of the Court's analysis in *Bucci* was the proposition that "[a]n individual does not have an expectation of privacy in items or places he exposes to the public." 582 F.3d at 116-17 (citing *Katz*, 389 U.S. at 351). As discussed above, *Carpenter* expressly rejects this

Likely recognizing the expansive surveillance powers it is claiming, the Government seeks to preempt any concern about its use of pole cameras by assuring the Court that they are used only to "address investigative needs in specific cases." Gov't Br. at 22. This is not a meaningful limitation because it is not required by law, can be changed unilaterally in the future, and need not be followed by other law enforcement agencies. Nor does it mitigate the Fourth Amendment concerns that attend such persistent surveillance of a home. The entire point of the Fourth Amendment is to require the independent oversight of impartial courts when the government wants to conduct searches and seizures that intrude upon reasonable expectations of privacy. In the Fourth Amendment context, reliance on the government's own self-imposed limitations would be misplaced. An individual police officer's judgment about when to continuously record all activities outside of a person's home is not an appropriate substitute for a warrant.

Even if it were appropriate to rely on the Government's self-imposed limitation, the specific limitation it proposes—to "address investigative needs in

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notion, holding that "a person does not surrender all Fourth Amendment protection by venturing into the public sphere." 138 S. Ct. at 2217.

specific cases"—shows precisely why a warrant is required. While "special needs beyond the normal need for law enforcement" can, in exceptional circumstances, render the warrant requirement inapplicable, *Skinner v. Railway Labor Executives Association*, 489 U.S. 602, 619 (1989) (internal quotations and citation omitted), a law enforcement need underscores the appropriateness of requiring a warrant, *see, e.g.*, *Ferguson v. City of Charleston*, 532 U.S. 67, 84 (2001) (the fact that evidence of drug use was turned over to police "does not merely provide a basis for distinguishing our prior cases applying the 'special needs' balancing approach . . . [it] also provides an affirmative reason for enforcing the strictures of the Fourth Amendment").

B. Defendants' Expectations of Privacy in the Whole of Their Movements Is Strongest Where, As Here, the Government Surveils the Home.

"It is a bedrock principle that the prophylaxis of the Fourth Amendment is at its zenith with respect to an individual's home." *United States v. Martins*, 413 F.3d 139, 146 (1st Cir. 2005) (citing *Kyllo*, 533 U.S. at 31) (abrogated on different grounds, *Hill v. Walsh*, 884 F.3d 16, 19 (1st Cir. 2018)). Moreover, it is well-established that the curtilage—the "[t]he area immediately surrounding and associated with the home"—is considered "part of the home itself for Fourth Amendment purposes." *Florida v. Jardines*, 569 U.S. 1, 6 (2013) (internal quotations and citation omitted). The curtilage is afforded protection equal to that

of the home because it is "intimately linked to the home, both physically and psychologically." *Bain*, 874 F.3d at 12 (internal quotations and citation omitted) (citing *Jardines*, 569 U.S. at 7).

In *Jardines*, the Court found that bringing a drug-sniffing dog to the defendant's porch, even without entering the home itself, constituted a "search" for purposes of the Fourth Amendment. 569 U.S. at 1. The Court concluded that the boundaries around the home that make up the home's "curtilage" are "easily understood from our daily experience." *Id*. at 7 (internal quotations and citation omitted) (citing *Oliver v. United States*, 466 U.S. 170, 182, n.12 (1984)). Here, Ms. Moore's driveway and front of her home plainly fall within areas of curtilage to which "the activity of home life extends." *Id*. (internal quotations and citation omitted). As such, the search that took place in this case—the recording of every activity in the driveway and front of the home for eight months—fell squarely within the areas that are at the "zenith" of Fourth Amendment concern.

Rather than confront the clear privacy implications of surveilling an individual's curtilage for eight months, the Government asserts in a footnote that *Jardines* (and *Jones*) "did not address expectations of privacy at all, since they relied on a trespass theory in finding that a search occurred." Gov't Br. at 20 n. 10. However, the Court acknowledged that property rights "are not the sole measure of Fourth Amendment violations" in *Jardines*, 569 U.S. at 5 (internal quotations and

citation omitted), and in *Jones*, the Court acknowledged that trespass is not the exclusive test under the Fourth Amendment. *Jones*, 565 U.S. at 411. Indeed, *Jones* expressly recognizes that "physical intrusion is now unnecessary to many forms of surveillance," and that such cases "remain subject to *Katz* analysis." *Id.* at 411, 414. *Cf. Berger v. State of N.Y.*, 388 U.S. 41, 65 (1967) (opinion of Douglas, J.) (opining that "electronic surveillance . . . in effect[] places an invisible policeman in the home").

The Government also argues that any expectations of privacy that Defendants may have had in the curtilage were diminished by the fact that activities outside the home "remained visible from a public street" and "could be seen by passersby." Gov't Br. at 25. But this argument was expressly rejected in *Jardines*, which held that the implicit license to enter the home's curtilage that is afforded to "the Nation's Girl Scouts and trick-or-treaters" does not extend to entering the home's curtilage with a drug-sniffing dog. 569 U.S. at 8-9. Similarly, the fact that a person (or a Google "Street View" car) may view and even take pictures of the curtilage of the home does not grant license to law enforcement to record every single movement that takes place within that curtilage over a period of eight months, without judicial oversight.

The eight-month duration of the surveillance of Ms. Moore's curtilage is also what distinguishes *California v. Ciraolo*, 476 U.S. 207 (1986), on which the

Government heavily relies. In *Ciraolo*, the government surveilled a backyard from a plane flying in public airspace, observing only such information as would be available to the "naked eye." *Id.* at 213. An apt analogue to *Ciraolo* would be a police officer who drives by a suspect's house, not a sophisticated electronic camera that can zoom in and out, indelibly recording eight months of activity.

Indeed, as the Supreme Court subsequently explained in *Kyllo*, if the plane in *Ciraolo* had been undertaking "*enhanced* aerial photography," the result would likely have been different: "While we upheld enhanced aerial photography of an industrial complex in *Dow Chemical*, we noted that we found 'it important that this is *not* an area immediately adjacent to a private home, where privacy expectations are most heightened.'" 533 U.S. at 33 (emphasis added and in original) (quoting *Dow Chemical Co. v. United States*, 476 U.S. 227, 237, n.4 (1986)). Here, too, the fact that the Government is surveilling the curtilage of a private home means that Defendants' "privacy expectations are most heightened." *Id.*

II. Evolving Technologies Must Not Displace Reasonable Expectations of Privacy In Favor of More Intrusive Surveillance.

In their famous 1890 article, *The Right to Privacy*, Samuel Warren and Louis Brandeis observed that it is "necessary from time to time to define anew the exact nature and extent" of the protections an individual has in their person and property. Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193 (1890). At a time when the technology of photography was

proliferating, Warren and Brandeis argued that existing legal rights had broadened over time in response to the "advance of civilization"—such that society's understanding of the "right to life" expanded to include the "right to be let alone," and the right to "property" now encompassed "every form of possession—intangible, as well as tangible." *Id*. at 193-95.

So, too, with the spheres of privacy that are protected by the Fourth Amendment. As technology advances, and the government acquires increasingly sophisticated surveillance devices like the pole camera at issue in this case, it is incumbent upon the courts to ensure that the increased ease and availability of advanced surveillance tools does not compromise the right to privacy traditionally protected by the Fourth Amendment. Moreover, in this era of rapid technological change, this court should also anticipate the ways in which the holding in this case may be applied to pole cameras and related technologies of the not-so-distant future.

A. The Advance of Technology Should Not Shrink the Zone of Privacy Protected by the Fourth Amendment.

Echoing the call to action in Professor Warren and Justice Brandeis's article, the Supreme Court has repeatedly stepped in to ensure that Fourth Amendment protections remain meaningful in the face of technological advancement. As part of these decisions, the Court has made clear that it is unwilling to mechanically

apply judicially-created exceptions to the warrant requirement from earlier eras in a manner that would vitiate modern reasonable expectations of privacy.

In *Riley*, for example, the Court held that a warrant is required to search the contents of a person's cell phone when the phone is seized incident to an arrest. In earlier decisions, the Supreme Court had carved out an exception to the warrant requirement for such searches incident to arrest, reasoning that officers should be able to search the person arrested and the area "within his immediate control" in order to remove any weapons that may be used to resist the arrest or to prevent the concealment or destruction of evidence. *Chimel v. California*, 395 U.S. 752, 763 (1969). Yet in reaching its decision in *Riley*, the Court rejected the government's argument that searching a person's cell phone is "materially indistinguishable" from searching that person's pockets. *See* 573 U.S. at 393 (reasoning that such a comparison "is like saying a ride on horseback is materially indistinguishable from a flight to the moon").

Similarly, in *Carpenter*, the Court observed that there is a "world of difference" between the "exhaustive chronicle of location information casually collected by wireless carriers" and more traditional "business records" that typically are afforded fewer protections. 138 S. Ct. at 2210. *Compare with United States v. Miller*, 425 U.S. 435 (1976) (holding that defendant had no expectation of privacy in financial records held by a bank). Critically, *Carpenter* recognized that

its holding was not meant to expand or otherwise revise Fourth Amendment doctrine—rather, it was an effort to keep "Founding-era understandings in mind when applying the Fourth Amendment to innovations in surveillance tools." 138 S. Ct. at 2214.

In *Kyllo*, the Court likewise aimed to "assure[] [the] preservation of that degree of privacy against government that existed when the Fourth Amendment was adopted" when it held that the use of an Agema Thermovision 210 thermal imaging camera to detect the heat patterns inside a home required a warrant. 533 U.S. at 28. In doing so, it rejected as a "mechanical interpretation of the Fourth Amendment" the government's argument that the thermal imaging was lawful because "it detected only heat radiating from the home's external surface." *Id*. at 35 (internal quotations and citation omitted). Importantly, the Court emphasized the relevance not just of the specific surveillance device at issue in the case, but also "more sophisticated systems that [were] already in use or in development," such as prototypes that purported to "see through" walls and other barriers. *Id*. at 36 & n.3. In short, digital is different.

Here too, the Court should reject the "mechanical interpretation" of the Fourth Amendment that equates traditional law enforcement surveillance from a public vantage point—the classic "stake out"—with a sophisticated electronic device that was (i) deployed to continuously monitor all movement within the

curtilage of the home for a period of eight months; (ii) enhanced by the ability to zoom, tilt, and pan the camera; and (iii) accompanied by a recording functionality that allowed law enforcement officers to peruse the historical surveillance from a remote location at their leisure. As discussed above, such pervasive surveillance can reveal a plethora of intimate details about a person's habits, hobbies, preferences, relationships, and other facets of their private life that otherwise would be impossible to glean through traditional surveillance, particularly when combined with other data. *See Carpenter*, 138 S. Ct. at 2218 ("[f]rom the 127 days of location data it received, the [g]overnment could, in combination with other information, deduce a detailed log of Carpenter's movements.").

In addition, the Court should take into account the fact that this type of persistent video surveillance is "remarkably easy, cheap, and efficient." *Carpenter*, 138 S. Ct. at 2218. The FREDI HD "Mini Super Small" camera, for example, is less than $50 and can support up to 17 hours' worth of recording.[3] For just $70 more, the ElectroFlip HD 720p Spy Security Pinhole Camera comes with an infrared recording capability, HD video and audio, motion detection, and other

[3] Sears, FREDI HD 1080P 720P Mini Super Small Portable Hidden Spy Camera, https://www.sears.com/fredi-hd-1080p-720p-mini-super-small-portable/p-SPM8768202123 (last visited Oct. 28, 2019).

features.[4] Given the broad and affordable choices among video recording technologies, the resource constraints that might otherwise hinder law enforcement personnel from conducting such pervasive surveillance have significantly decreased—leaving the Fourth Amendment as one of the few backstops protecting the "right of a man to retreat into his own home." *Silverman v. United States*, 365 U.S. 505, 511 (1961).

B. Future Pole Cameras Will Present an Even Greater Threat to the Right to Retreat Into the Home.

Lastly, when applying the Fourth Amendment to the facts of this case, the Court should bear in mind that technology often outpaces the law. Upholding the government's warrantless use of a pole camera in front of the defendants' home today may lead to significant, unintended consequences when applied to technology of the future. Moreover, as the costs of cameras, cloud storage, and software continue to decrease over time, law enforcement will lack the practical limitations that would otherwise prevent futuristic pole cameras from being ubiquitously deployed in front of every home—thereby enabling a veritable surveillance state.

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[4] Sears, ElectroFlip HD 720p Spy Security Pinhole Camera, https://www.sears.com/homesecur-hidden-spy-camera-warehouse-security-hd-720p/p-SPM8496553911 (last visited Oct. 28, 2019).

The notion that surveillance technologies can outpace Fourth Amendment jurisprudence is not new. In *Florida v. Riley*, 488 U.S. 445 (1989), Justice Brennan dissented from the Court's holding that a helicopter hovering over a person's backyard at 400 feet did not violate that person's expectation of privacy. Justice Brennan noted that the Court's reasoning could extend not only to the use of a helicopter, but also if "the police [had] employed [a] miraculous tool to discover not only what crops people were growing in their greenhouses, but also what books they were reading and who their dinner guests were." *Id.* at 462 (Brennan, J., dissenting). The "miraculous tool" envisioned by Justice Brennan in 1989 is not unlike the drones that are available today.

More recently, the *Carpenter* Court recognized that "[w]hile the records in [that] case reflect[ed] the state of technology at the start of the decade, the accuracy of CSLI [was] rapidly approaching GPS-level precision." *Carpenter*, 138 S. Ct. at 2218–19. It was thus important for the Court to consider not just the state of the relevant surveillance technology at the time of its decision, but also the trajectory of that technology over time.

It is not difficult to imagine the myriad ways in which pole camera surveillance can be more intrusive when enhanced, even with existing technology. This trend is already taking shape as surveillance cameras and video management software become more powerful: i2c Technologies' cameras, for example, offer

"[r]eal-[t]ime alerts and remote access," with software that can support hundreds of cameras on a single network.[5] The company "Covert Law Enforcement" offers a pole camera that provides "the highest quality 720P/1080P HD imaging and a 30x zoom, giving the best accuracy and clarity for any case."[6] Similarly, WCCTV's 4G HD Dome camera can provide high-definition video "at up to 25 frames per second over a cellular connection."[7] Furthermore, video management software enables hours of footage to be reviewed in minutes by employing features like motion detection.[8]

In addition to these enhanced motion detection features and improved video footage quality, the growing development and use of "video analytics" allow more information and inferences to be gleaned from video footage, which will further

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[5] i2c Technologies, *Intelligent Video Surveillance Integrated Solutions for Law Enforcement*, https://www.i2ctech.com/wp-content/uploads/2017/07/i2cLawEnforcementBrochure.pdf?x28211 (last visited Oct. 28, 2019).

[6] Covert Law Enforcement, *Reliability, Hidden in Plain Sight*, https://www.covertlawenforcement.com/ (last visited Oct. 28, 2019).

[7] WCCTV, *Benefits of Rapid Deployment Camera Systems*, https://www.wcctv.com/benefits-of-rapid-deployment-camera-systems/ (last visited Oct. 28, 2019).

[8] *See, e.g.*, i2c Technologies, *Deployable Surveillance Cameras for Police*, https://www.i2ctech.com/industry/deployable-surveillance-cameras-police/ (last visited Oct. 28, 2019); Dan Cremins, *Find Video Surveillance Evidence Faster with these 5 Must-Have VMS Features*, MARCH NETWORKS (Aug. 18, 2016), https://www.marchnetworks.com/intelligent-ip-video-blog/find-video-surveillance-evidence-faster-with-these-5-must-have-vms-features/.

reduce existing resource limitations on persistent video surveillance and may, in the future, permit predictive judgments to be drawn based on human activity.

By way of background, whereas traditional video cameras merely capture raw video footage that must be viewed and processed by a human, intelligent video analytics tools harness the power of artificial intelligence (AI) to enable the cameras themselves to process the footage. As a result, the cameras are able to "[u]nderstand[] the context of the entire scene and its background," classify objects, and compile information into a database that law enforcement officials can subsequently search using key terms.[9] One such product's website, for example, features a video of a woman riding a bicycle, and explains that although a human would only see a woman riding a bicycle, the product detects, in a searchable format, a "(1) woman, (2) wearing black and white, (3) riding on a bicycle, (4) going at a speed of less than 8 mph, in a (5) southerly direction."[10] Another company offers video analytics tools such as a "24/365 outdoor algorithm" for target detection and monitoring in a variety of different environments, and a tool dubbed "[l]oiter [a]nalytics," which aims to detect humans remaining too long at a

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[9] *E.g.*, BriefCam, *It's Not Magic . . . It's Science*, https://www.briefcam.com/technology/how-it-works/ (last visited Oct. 28, 2019).
[10] *Id.*

particular scene.[11] There is also a market for intelligent video analytics capable of detecting "unusual activity." For example, some companies market software that they allege can predict when someone is about to shoplift by analyzing body language.[12] In short, intelligent video analytics is a growing field of study and investment is expected to mature. For example, future capabilities may include such features as automatic kinship verification (determining if two people have a biological relationship)[13] or multi-target, multi-camera tracking (which aims to determine the position of groups of people at all times from multiple video streams taken by multiple cameras).

Although intelligent video analytics may seem like a futuristic fantasy, in reality it is becoming increasingly available to law enforcement. Some brands, such as IC Realtime, rely on cloud-based video analytics to make video instantly searchable for items such as "specific animals, people wearing clothes of a certain

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[11] WCCTV, Video Analytics, https://www.wcctv.com/wcctv-video-analytics/ (last visited Oct. 28, 2019).

[12] *See* Jaclyn Jeffrey-Wilensky, *Here's how AI could help catch shoplifters in the act*, NBC NEWS (March 18, 2019), https://www.nbcnews.com/mach/science/here-s-how-ai-could-help-catch-shoplifters-act-ncna984566.

[13] *See* Miguel Bordallo Lopez et al., *Kinship verification from facial images and videos: human versus machine*, MACHINE VISION AND APPLICATIONS (May 29, 2018), https://www.jorgegoncalves.com/docs/mvap18.pdf.

color, or even individual car makes and models."[14] Others, such as the startup Boulder AI, build artificial intelligence directly into the hardware (and as a result, the camera can conduct video analytics offline).[15] In fact, a new computer chip can "build" AI into the hardware of any regular, cheap camera—enabling a traditional camera to know things like "your name, what you're holding, or that you've been loitering for exactly 17.5 minutes."[16]

Meanwhile, by applying facial recognition technology to video surveillance, law enforcement agents are increasingly able to efficiently and effectively detect and track specific individuals over time. Unlike traditional video surveillance, facial recognition technology is able to link facial features to individuals' names, addresses, criminal history, and, according to some vendors, even emotions — thereby stripping people of the anonymity they typically enjoy when they step out into the public square.[17] Law enforcement agencies are increasingly purchasing

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[14] James Vincent, *Artificial Intelligence is Going to Supercharge Surveillance*, THE VERGE (Jan. 23, 2018), https://www.theverge.com/2018/1/23/16907238/artificial-intelligence-surveillance-cameras-security.

[15] *See id*.

[16] Tom Simonite, *Thanks to AI, These Cameras Will Know What They're Seeing*, WIRED (April 17, 2018), https://www.wired.com/story/thanks-to-ai-these-cameras-will-know-what-theyre-seeing/.

[17] *See* Tim Lewis, *AI can read your emotions. Should it?* THE GUARDIAN (Aug. 17, 2019), https://www.theguardian.com/technology/2019/aug/17/emotion-ai-artificial-intelligence-mood-realeyes-amazon-facebook-emotient.

such technologies and using them to track individuals on a citywide basis.[18] In Detroit, for example, police have applied facial recognition to live video streams throughout the city in order to "identify suspects in violent crimes."[19] Such real-time facial recognition technology is also reportedly being used by the Chicago police, and it may soon be deployed in New York City, Orlando, and Washington, D.C., as well.[20]

When facial recognition technology is incorporated into cameras that are pointed not only at one house, but also at schools, houses of worship, political rallies, abortion clinics, and other locations, such technology could enable law enforcement to target and monitor people wherever they go and paint an intimate, detailed picture of their lives—regardless of whether their activities merit any degree of suspicion.[21] Nor do the monitoring capabilities of such technologies even stop with the recognition of faces. In China, for example, authorities already

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[18] *See* Clare Garvie & Laura M. Moy, *America Under Watch: Face Surveillance in the United States* (May 16, 2019), https://www.americaunderwatch.com/.

[19] Erin Einhorn, *A Fight Over Facial Recognition is Dividing Detroit*, NBC NEWS (Aug. 22, 2019), https://www.nbcnews.com/news/us-news/fight-over-facial-recognition-dividing-detroit-high-stakes-police-privacy-n1045046. The article notes that the city is 80 percent black, "with a sizeable population of Middle Eastern, Asian and Latin American immigrants," which may make the technology particularly prone to misidentifying people. *Id*.

[20] *See* Clare Garvie & Laura M. Moy, *America Under Watch supra* note 18.

[21] *See id*.

have reportedly begun adopting technology that uses body shapes and the way people walk in order to identify people even when their faces are obscured.[22]

Accordingly, before accepting the Government's argument that people do not have an expectation of privacy in "areas exposed to public view," Government Brief at 16, this Court should consider not only the pole camera at issue, but also the "more sophisticated systems that are already in use or in development." *Kyllo*, 533 U.S. at 36. Given the rate at which video surveillance technologies are advancing, law enforcement officials may soon have at their fingertips the ability to look up and view, in real time, any person going about their daily lives, from carrying groceries inside their homes or driving their kids to school, to visiting a synagogue or having an affair. The same technology would also enable the targeting of groups of people in ways that might chill freedoms of association and expression, such as through targeting groups at political rallies or public protests. Under the Government's proposed reading of the Fourth Amendment, all of this and more will be fair game without a warrant the moment a person takes one step outside their home.

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[22] *See* Christopher Bodeen, *Hong Kong protestors wary of Chinese surveillance technology*, ASSOCIATED PRESS (June 13, 2019), https://www.apnews.com/028636932a874675a3a5749b7a533969.

CONCLUSION

For the foregoing reasons, the Court should affirm the district court's ruling granting Defendants–Appellees' Motion to Suppress.

Dated: October 28, 2019

By: /s/ Trisha B. Anderson

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CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rule of Appellate Procedure ("Fed. R. App. P.") 32(g)(1), I certify as follows:

1. This Brief of *amicus curiae* in Support of Defendants-Appellees complies with the type-volume limitation of Fed. R. App. P. 29(a)(5) because this brief contains 6,307 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f); and
2. This Brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word 2016, the word processing system used to prepare the brief, in 14-point Times New Roman font.

October 28, 2019

/s/ Trisha B. Anderson
Trisha B. Anderson

CERTIFICATE OF SERVICE

I hereby certify that on this 28th day of October, 2019, I caused true and correct copies of the foregoing Brief to be electronically filed with the Clerk of the Court for the United States Court of Appeals for the First Circuit.

I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

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