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I, SPY ROBOT

The ethics of robots in national intelligence activities

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The ethics of military robots is marching ahead, judging by recent news coverage and academic research. Yet there has been little discussion concerning robots in the service of national intelligence and espionage, which are omnipresent national security activities. This is surprising, because most military robots are used for surveillance and reconnaissance, and their most controversial uses can be traced back to the Central Intelligence Agency (CIA) in targeted strikes against suspected terrorists (O'Connell 2012, p. 270).

In this chapter, we examine the key moral issues for the intelligence community with regard to the use of robots for intelligence collection. First, we survey the diverse range of spy robots that currently exist or are emerging, and examine their value for national security. This includes describing a number of plausible scenarios in which they have been (or could be) used, including: surveillance, attack, sentry, information collection, delivery, extraction, detention, interrogation and as Trojan horses. Second, we examine several areas in which spy robots present serious ethical and legal challenges. We conclude by examining some moral concerns with shifting from intelligence collection to action, as enabled by robotics technology.

Emerging robotics technology

This first section surveys existing robotic surveillance and the emerging technologies. Military robots are arguably more effective than their human counterparts in completing national security tasks that are dull, dirty and dangerous. But note that robot–human interaction is likely to remain a potential weakness. We examine cases where the overuse of robots might also create problems. Finally, we briefly examine emerging civilian applications for surveillance robots.

Rise of the spy robots

Robotics has been a game-changer in national security and intelligence, particularly in the development of military capability. We now find military robots in just about every domain including, air, land, sea and space. These robots come in many sizes: from tiny insect-like robots to aerial drones with wingspans greater than a Boeing 737 aircraft. Some robots are fixed to battleships, while others patrol national borders. There has been research into micro-robots, swarm robots, humanoids, chemical bots and biological–machine integrations. As we might expect, military robots have warlike names such as TALON SWORD, Crusher, BEAR, Big Dog, Predator, Reaper, Harpy, Raven, Global Hawk, Vulture, Switchblade and so on. But not all military robots are designed to function as weapons. For example, the purpose of the Battlefield Extraction Assist Robot (BEAR) is to retrieve wounded soldiers on a battlefield (Rutherford 2009).

Military robots prove themselves useful in the service of national security because they are more effective than their human counterparts in completing dull, dirty and dangerous jobs (known as the three Ds). The military often have dull jobs such as extended reconnaissance, patrols or standing guard over perimeters. Military robots can perform these functions well beyond the limits of human endurance. Dirty jobs include such military tasks as working with hazardous materials or cleaning up after nuclear or biochemical attacks. Military robots can operate in environments unsuitable for humans, such as underwater and outer space. Dangerous jobs that can be performed by military robots include searching for enemy combatants inside cave networks, controlling hostile crowds, or clearing improvised explosive devices (IEDs).

Arguably, there is a fourth D that needs to be considered. This is the military robots' ability to act with 'dispassion'. The claim here is that military robots are better at seeing through the 'fog of war' to reduce unlawful and accidental killings (Arkin 2010, p. 333). Robots do not act with malice, hatred or other emotions that may lead to war crimes and other abuses, such as rape. Robots do not have an instinct of self-preservation that causes them to act out of fear. They are unaffected by emotion, adrenaline and hunger. Where an ordinary soldier's judgment is undermined by sleep deprivation, low morale and fatigue, the military robot continues to operate at the same level. They are objective, unblinking observers. So the argument is that robots can perform many standard military tasks better – that is, more effectively and more ethically – than humans in the high-stress environment of the battlefield.

The weakest link?

Robots can replace humans when it comes to certain tasks but, in most situations, humans will still be in control. Humans either will have significant input in terms of the robot's actions or will maintain the capacity to veto a robot's course of action. The 'human factor' is likely to remain a significant issue for the use of robotic technology, with robot–human interaction a potentially weak link in practical applications. For example, unmanned aerial vehicles (UAVs) such as Predator and Global Hawk can stay in the air far longer than a normal human being. But human operators must still be awake to the activities of such vehicles. Some military UAV operators may be overworked and fatigued, which can lead to errors in judgment. But even in the absence of these factors, humans still make wrong decisions, either through incompetence or bad motivation.

A second worry is that UAV operators – who might control drones from the other side of the world – are more likely to become detached and care less about killing. Royakkers & Van Est (2010, p. 295) argue that UAV operators are more likely to morally disengage from their task and that this disengagement 'limits, or even eliminates, proper reflection among cubicle warriors on the life-and-death decisions they make'. The concern is that this might lead to a greater number of unjustified strikes and collateral damage. But other reports indicate that UAV pilots become hypersensitised, not desensitised. Controllers have an intimate view of their targets via video streaming, following them for hours and even days. They can also see the aftermath of a strike, which may include strewn body parts and dead children. Some reports indicate that operators are, in fact, more likely to suffer from post-traumatic stress disorder (PTSD) than soldiers in the battlespace (Strawser 2013, p. 16).

A third question about robot–human interaction concerns the programming of robots in cases where they have access to better decision making information than their human masters. In some cases, robots will have better situational awareness because they are fitted with advanced sensors that allow them to see in the dark, through walls, to be networked with other computers and so on. This raises the following problem: if a robot knows better, should it ever refuse a human order? Following orders is the bedrock for a chain of command and accountability. Let's consider a scenario where a human orders a robot to fire a missile at a house that is thought to belong to enemy combatants. The robot, however, uses its superior sensors to identify that the house is occupied by non-combatants. Should the robot refuse the order to attack the house? Given that we already rely on the technical capacities of UAVs to enable more precise strikes, are we also obliged to use their superior information-collection capabilities to minimise collateral damage in this way?

It might also be the case that robots themselves are the weakest link. For one thing, robots can effectively replace humans in physical tasks – such as heavy lifting or working with dangerous materials – but it does not seem likely that they will be able to take over more psychologically nuanced jobs such as gaining the confidence of an agent, which involves humour, mirroring and other social skills. So the less technologically dependent area of human intelligence (HUMINT) will still be important in the foreseeable future.

The extensive use of military robots might bring tactical benefits, but it can also undermine strategic goals. We have already heard that the use of technology in war or peacekeeping missions is not helping us win the hearts and minds of the relevant local populations (Kilcullen & McDonald Exum 2009; Sluka 2011, p. 76). Sending robot patrols into politically sensitive environments to keep the peace can send the wrong message about our concern for residents. Human diplomacy is still required for such tasks. Furthermore, the extensive use of UAVs in war might also backfire if enemy combatants come to believe that we are cowardly for not engaging with them face-to-face. They may also conclude that we are not committed to the fight (Enemark 2013, p. 6). This undermines strategic goals by making the enemy more resolute and fuelling their propaganda and recruitment efforts, which could then lead to a new crop of determined terrorists.

Finally, without defence, robots could be targeted for capture. This presents a problem in that they are likely to contain both critical technologies and classified data. Clearly we should not allow robots to be captured. But self-destruction could be triggered at the wrong time and place, injuring people and creating an international crisis. So do we give them defensive capabilities, such as evasive manoeuvres or non-lethal weapons like repellent spray, Taser guns or rubber bullets? Such 'non-lethal' measures might also become deadly. In running away, for example, a robot might run down a child or a group of non-combatants. And we already see frequent news reports about unintended deaths caused by Tasers and other supposedly non-lethal weapons (Black 2013).

Civilian applications

Civilian applications for surveillance robots are also emerging. These include robots that watch for suspicious behaviour in public places, such as children's playgrounds or major sporting events. It is likely that current and future biometric capabilities will be used to create robots that can detect faces, drugs and weapons at a distance and underneath clothing. Robots can also be used for alerting people, in tasks such as providing information, reciting laws or issuing warnings. Such capabilities will almost certainly provide an opportunity for intelligence gathering on an unprecedented scale. For example, the K5 Autonomous Data Machine has enough camera, audio and other sensor technology to produce 90 terabytes of data a year per unit. It also runs behavioural logarithms that analyse multiple data points simultaneously to predict when a situation may be on the verge of becoming dangerous (Statt 2013, para. 8).

In delivery applications, special weapons and tactics (SWAT) police teams already use robots to interact with hostage-takers and in other dangerous situations. So robots could be used to deliver other items or to plant surveillance devices in inaccessible places. Likewise, they can be used for extractions, too. As mentioned earlier, the BEAR robot can retrieve wounded soldiers from the battlefield. In the future, an autonomous car or helicopter might be deployed to extract or transport suspects and assets, thereby reducing the risk to personnel.

Robots can also be used for the purpose of detention. Robot sentries are already being used to guard buildings, and recently have been guarding people too (Pasculli 2013, p. 8). One benefit of this is that it eliminates the types of prisoner abuse that were perpetrated by the human guards at Guantanamo Bay Naval Base in Cuba and Abu Ghraib prison in Iraq. But the unemotional and dispassionate nature of robots also makes them well suited to performing interrogation and torture. Robots can monitor vital signs of interrogated suspects as well as a human doctor can, but without the entanglement of the Hippocratic Oath to do no harm. They could also administer injections and even inflict pain in a more controlled and perhaps more effective way.

Ethical and legal challenges

This section examines some of the key ethical and legal challenges for using spy robots. First, I examine some responsibility and compliance issues related to the use of spy robots, including who takes responsibility for serious accidents, e-waste environmental problems, legal obligations and privacy concerns. I then discuss the use of spy robots to manipulate, coerce and deceive our adversaries. Finally, I consider the impact of spy robots on the capabilities of the institutions that use them, and the potential for proliferation.

Responsibility and compliance

First of all, we should note that robot errors could plausibly cause serious accidents. We all know that technical faults are a fact of life and that they happen all the time in the technology we use daily. So it would be naïve to think that something as complex as a robot would be immune to such problems. For example, in 2011 an RQ-Shadow UAV collided with a military cargo plane in Afghanistan, forcing it to make an emergency landing (Hodge 2011). In 2010, a software anomaly caused operators to lose control of an MQ-8B Fire Scout helicopter UAV for about half an hour, whereupon it strayed into restricted airspace over Washington, DC (Cavas 2010). And in 2007, a South African robotic anti-aircraft weapon (an Oerlikon GDF-005) malfunctioned, emptying its twin 250-round auto-loader magazine of high-explosive 0.5 kg 35 mm cannon shells, killing nine soldiers and wounding fourteen more (Shachtman 2007). Regardless of whether or not harm is caused accidentally or intentionally, the autonomy of such robots leads to questions about who (or what) is responsible for their actions. Can we attribute responsibility to the robot itself or should we hold the operator responsible (or perhaps even the programmer)? Will manufacturers insist on a release of liability – such as the standard end-user licensing agreements (EULA) we agree to when we use software? Or should we insist that such products be thoroughly tested and proven safe?

A second issue is the legal obligations of robots. As robotics become more pervasive in our everyday lives, it is likely that they will share our roads, airspace and waterways. So it is necessary that they should comply with domestic laws. This includes spy robots in the service of national intelligence, since – along with autonomous cars, domestic surveillance robots and rescue robots – they will interact with society at large. But what about complying with something like a legal obligation to assist others in need, such as required by a Good Samaritan Law or basic international laws that require ships to assist other vessels in distress? Would an unmanned surface vehicle, or robotic boat, be legally obliged to stop and save the crew of a sinking ship? This was a highly contested issue in the Second World War (e.g. the Laconia incident), when submarine commanders refused to save stranded sailors at sea, as required by the governing laws of war in place at the time. It is not unreasonable to claim that this obligation should not apply to submarines, because stealth is their primary advantage and surfacing to rescue gives away their position. Could we therefore use similar reasoning to release unmanned underwater vehicles (UUVs) and unmanned surface vehicles (USVs) from this obligation?

A third issue is the environmental, health and safety problems created by the extensive use of robots. E-waste is already a major health and environmental hazard across the globe, with an estimated 50 million tonnes of e-waste produced each year in the US alone (Kaushik 2014, para. 6). The increasing use of robots will add to this problem in new and potentially unexpected ways. Microbots and disposable robots can be tiny (e.g. nanosensors) and can be deployed in swarms. If we do not have a process for cleaning them up at the end of their product life cycle, then they could be ingested or inhaled by animals or people. Natural allergens can be harmful to our health, but imagine the damage caused by engineered material that potentially contain toxins such as mercury or other chemicals in their batteries. This is perhaps a problem for any industry that adopts or sells digital technologies, but one that is particularly important in this context.

For the sake of completeness, we should also mention privacy concerns, though these are familiar in current discussions (Calo 2012; Solove 2011). An obvious privacy concern is microbots, which might look like innocuous insects or birds, but can peek into windows or crawl into a house. But another serious privacy issue arises when we consider the ever-increasing biometric capabilities of robots. This includes technology to recognise faces from a distance or in a crowd, detect drugs or weapons under clothing, or detect contraband substances inside a house from the outside. These technologies blur the important legal distinction between 'surveillance' and 'search', which is intended to protect the right to privacy. The difference here is that, at least in some key nations, law enforcement officials are legally obliged to obtain a judicial warrant before conducting a search. The presumption is that a search infringes an individual's right to privacy and so law enforcement officials must justify their actions by proving reasonable suspicion. In contrast, surveillance does not require the same legal standard. So as technology allows surveillance to be more intrusive, there may be a legal gap that puts privacy at risk.

Manipulation, coercion and deception

The use of spy robots might also be legally controversial in other ways. For example, we could be tempted to use the capabilities of robots in extraditions, torture, assassinations, transport of contraband substances, and so on.

But more broadly speaking, should we be creating machines that intentionally deceive, manipulate or coerce people? Consider how the CIA bribed Afghani warlords with Viagra for information, which is a less obvious payment than money or weapons (Harnden 2008). Sex is one of the most basic human needs and is a well known resource for manipulation. One disconcerting use of robotic technology might involve providing informants with a sex-robot. Without getting into the ethics of sex-robots here (Levy 2012), such robots could also have secret surveillance and strike capabilities – a femme fatale, of sorts.

Even if not illegal, there are some activities that are unethical, such as the fake vaccination operation in Pakistan that obtained DNA samples with the aim of finding Osama bin Laden. Posing as a humanitarian or Red Cross worker to gain access to enemy territory is an example of perfidy: it breaches what little mutual trust we have with our adversaries, and this is counterproductive to achieving lasting peace. But perhaps robotic mosquitoes could have been deployed instead, thus avoiding the suspicion and backlash that humanitarian workers consequently suffered. Animals and insects are typically not considered to be combatants or anything of concern to our enemies. Even if such acts are not illegal, however, it is still possible for us to act in bad faith, and we should be mindful of that possibility.

Issues of deception also arise in cases where robots are used as Trojan horses. Imagine that we capture an enemy robot, hack into it, reprogram it, and then send it back home to work secretly for us. Would that be any different from masquerading as the enemy by wearing their uniform – another perfidious ruse? Another questionable scenario might be the commandeering of a robotic car or plane owned by the other side. Or perhaps we might commercially manufacture robots with back-door chips that allow us to hijack the machine when it falls into someone else's possession.

Some of these uses for robots might be clever and effective, but the point about deception and bad faith can be related back to a number of criticisms we have so far made about spy robots. The tactical benefits might undermine our strategic goals. They might erode important legal principles. Or such acts might give the impression that we are unwilling to get our hands dirty and make it seems as though we are afraid to commit fully to fighting our battles.

Personnel and proliferation

Another set of concerns with the use of spy robots is the impact they might have on personnel and the capabilities of institutions that use them. For example, we should think about how the use of robotics might impact recruitment in the intelligence community. Modern militaries have demonstrated an increased demand for UAVs that can perform armed attack functions (Sparrow 2009, pp. 169–70; Strawser 2010, p. 342). This will have implications for recruitment and training. Likewise, the increasing use of robots for the purposes of national security intelligence collection will impact the type of people who are recruited and the way they are recruited. Furthermore, how do we process and analyse all the extra information we are collecting from our drones and digital networks? If the data flood is not managed effectively by the intelligence community, we risk overloading our decision makers with information, and missing the vital piece of intelligence that can prevent a disaster.

Furthermore, an increased reliance on robots by the intelligence community raises issues of technological dependency and a resulting loss of certain human skills (Carr 2014). We can see this effect when we look at technology that over time has become commonplace. We don't remember as well as we once did, because the development of the printing press means that all our stories can be captured on paper. The widespread availability of calculators means that most of us are not as good at doing arithmetic in our heads as we would once have been. Grammar and spelling skills have deteriorated because we rely on word-processing programs with spell-check functions. This could be a serious problem when highly skilled professions are lost. For example, some are worried that the development of medical robots might cause human surgeons to lose their skills in performing difficult procedures. What would happen if we were in a remote location, or if there was a power cut and we didn't have access to the robots on which we had become dependent? This problem is magnified in the context of national security, since we might be fighting an enemy who is working hard to destroy or disrupt our robotic capabilities. This has led some experts to argue that we should purposefully keep more 'humans in the loop' and reverse the des-killing of human operators through the use of automated machinery (Hagerott 2014).

Finally, the ongoing development of spy robots could create an intelligence arms race. Here we could see a proliferation of spy robots as our adversaries develop or acquire the matching technologies and use them against us. Many nations have already deployed (or are developing) military robots, and the international UAV market is expected to grow from $5.2 billion in 2013 to $8.32 billion by 2018 (Markets and Markets 2013; Zenko & Kreps 2014, p. 7). This will almost certainly lead to the cat-and-mouse games of military capabilities and countermeasures that we have witnessed in the development of nearly every military technology, from crossbows and tanks, to nuclear missiles and stealth technologies. Most recently, the Chinese newspaper *Xinhua* (2014) claimed that China had successfully tested a laser defence system capable of shooting down small-scale drones flying at low attitude.

From intelligence collection to armed attack

In this final section, we examine one particularly important aspect of the use of spy robots: that is, the move from intelligence collection to engaging in an armed attacked on a target. We briefly describe the moral dilemma of national security intelligence collection, which is the tension that exists between a state's duty to protect the political community versus its duty to preserve the rights of individuals. We then discuss the problem with weaponising spy robots. We finish this chapter by examining the (potential) impact of the use of spy robots on international norms.

Intelligence collection

Recently, scholars have been increasingly concerned with the ethics of intelligence collection. Gill (2009), for example, has discussed the way in which the prosecution of the 'War on Terror' has brought up problems to do with intelligence gathering and respect for human rights. Quinlan (2007) has noted that effective intelligence practice means doing things that are contrary to standard moral rules. And Erskine (2010) surveys a number of ethical frameworks that have been employed in assessing actions involved in intelligence collection.

But recent events have brought particular ethical concerns to light, namely 'over the growing ability and tendency of intelligence and security services to intercept, monitor, and retain personal data in an increasingly cyber-dependent world' (Bellaby 2012, p. 94). There are aspects of intelligence gathering, as practised by all major countries, that appear to be morally disreputable. The Snowden leaks, in particular, allowed previously hidden intelligence-collection practices to be revealed to the public, which provoked widespread alarm, condemnation and embarrassment. The concerns raised include the number of people caught up in intelligence collection dragnets, misuses of 'metadata', inadequate protection of confidential personal information, undisclosed 'partnerships' with major telecom and internet companies, and so on (Macaskill & Dance 2013).

We also believe, however, that political leaders have an ethical obligation to act so as to protect their people. National security intelligence is the intelligence collected, analysed and disseminated to decision makers in the task of ensuring the security of the state. This includes the security of individuals within and between states, not just the prevention or prosecution of wars between states. This inclusive definition of security is more accurate in tracing how national security intelligence has evolved and responded since the end of the Second World War, from a pre-occupation with fighting or preventing wars between states to supporting a broader human security agenda (Walsh 2011, p. 10).

In addition, without intelligence collection we would not sufficiently understand the nature of some important threats that we face. The main purpose of national security intelligence is to provide necessary information to policymakers that may help them in making decisions. The presumption is that good (i.e. accurate, comprehensive and timely) information will lead to more effective choices on the part of government officials (Johnson 2010, p. 5).

As such, intelligence agencies face a tension between, on one hand, their duty to protect the political community and, on the other, the reality that intelligence collection may entail activities that negatively affect individuals (Bellaby 2012, p. 94). Clearly it is not viable for intelligence agencies to maintain a permanently shadowy existence, free to act out of sight and out of mind. There is, however, an important distinction between vacuuming up all available technical data for analysis and collecting targeted intelligence for the purposes of national security. The point here is that targeted intelligence collection by spy robots might be morally justified in some cases. But the indiscriminate collection of data is likely to be neither justified nor effective.

A licence to kill?

A further ethical problem for the use of spy robots, on top of the need to justify their use in intelligence collection, is the fact that they are frequently armed and can shift very quickly from surveillance to attack. The tighter coupling of surveillance and the decision to kill in weaponised spy robots has placed a range of unique demands on UAV operators (Asaro 2013, p. 207). For one thing, UAVs have a particularly useful capability for reconnaissance that allows the operator to surveil difficult-to-reach areas for lengthy periods without people being put at risk on the ground. But it is but a short step to arming such UAVs, perhaps as a way of protecting the UAV or to take advantage of the opportunity to hit a terrorist cell. This blurs the line between armed conflict and intelligence collection, a distinction that is getting fuzzier all the time.

If the line between espionage and war is becoming more blurry, and if robots are used for espionage, under what conditions could their use amount to an act of war? Espionage is not considered to be a *casus belli* (i.e. a sufficiently just cause) for going to war. War is conventionally understood to be an armed, physical conflict between political communities. But so much of our modern national infrastructure is dependent on digital or information-based assets that we could potentially be seriously harmed by non-kinetic attacks (i.e. cyberweapons that damage computer systems or steal information). Indeed, the US has declared that, as part of its cyberpolicy, it reserves the right to retaliate with kinetic means to a non-kinetic attack. Or, as one US Department of Defense official said, 'If you shut down our power grid, maybe we will put a missile down one of your smokestacks' (Gorman & Barnes 2011, para. 3; Lucas 2013, p. 369). And what if the spy robot, while trying to evade capture, accidentally harmed a foreign national? Might that also be a flashpoint for armed conflict?

International norms

This leads us to our final area of ethical concern, which is the impact that the use of spy robots has (or might have) on international norms. Some robots – such as the Predator, Reaper and close-in weapon system (CIWS) – already have lethal defensive or offensive capabilities. This creates uncertainty about compliance with International Humanitarian Law (IHL) or the Law of Armed Conflict (LOAC). It might be argued that the use of lethal robots represents a disproportionate use of force relative to the military objective. This refers to the collateral damage, or unintended death of nearby innocent civilians, caused by, say, a Hellfire missile launched by a Reaper UAV. What is an acceptable rate of innocents killed for every bad guy killed: 2:1, 10:1, 50:1? The number has not been agreed upon and it continues to be debated, particularly with regard to asymmetric conflicts.

In contrast to the issue with collateral harm is the opposite problem of a perfectly accurate targeting system. Let's imagine a scenario where we were able to create a robot that targets only combatants and that leaves no collateral damage. Perversely, this might also violate one of the International Committee of the Red Cross's (ICRC) guidelines, which bans weapons that cause more than 25 per cent field mortality and 5 per cent hospital mortality. A robot that kills almost everything it targets could have a mortality rate approaching 100 per cent – well over the

ICRC's 25 per cent threshold. This is possible given the superhuman accuracy of machines. Such a robot would be a fearsome, inhumane and devastating prospect in war, and would go against the infamous Martens Clause in IHL that prohibits unconscionable weapons and tactics (Ticehurst 1997).

There is also a line of argument that suggests we should allow robots to make their own attack decisions (i.e. autonomous robots) (Arkin 2010). Critics argue, however, that robots do not have the human abilities of judgment and interpretation necessary to distinguish combatants from non-combatants (Asaro 2012, p. 693). In other words, robots cannot satisfy the principle of distinction. This principle – which is fundamental to the Geneva Conventions and the underlying Just War tradition – requires that we do not target non-combatants (Begby, Reichberg & Syse 2012, p. 337). But a robot already has a hard time distinguishing a terrorist pointing a gun from, say, a child holding a cane. Even humans have a hard time with this principle, since a terrorist might look exactly like an Afghan shepherd with an AK-47 who's just protecting his flock of goats.

Other developments in robotics technology might have implications for IHL conventions. As we develop human enhancements for soldiers, whether pharmaceutical or robotic integrations, it is unclear whether we have created a biological weapon (Lin, Mehlman & Abney 2013, p. 31). The Biological Weapons Convention (BWC) does not specify that bioweapons need to be microbial or a pathogen. So, in theory, a cyborg with super-strength or super-endurance could count as a biological weapon. Of course, the intent of the BWC was to prohibit indiscriminate weapons of mass destruction (again, related to the issue of discriminate weapons). But what if a soldier became able to resist pain through the use of robotics? What would then count as torturing that person? Would taking a hammer or an electric saw to a robotic limb count as torture?

Conclusion

We know that robotics is becoming increasingly important for intelligence collection because robots are better than humans at completing some national security tasks that are dull, dirty and dangerous. But we also know that the robot–human interaction is a potentially weak link in practical applications. And the overuse of robots can present significant problems. Consequently, we should be wary of the temptation to use spy robots, particularly in ways that are ethically and legally questionable. There are a number of responsibility and compliance issues, including establishing responsibility for serious accidents, e-waste environmental problems, legal obligations and privacy concerns. Spy robots also present a range of new possibilities to manipulate, coerce and deceive our adversaries. In addition, there is likely to be significant impact on the capabilities of the institutions that use them.

A particular ethical concern, however, is the proliferation of spy robots and the implications of weaponising them. The increasing use of spy robot technology certainly highlights the need to justify such enhanced methods of intelligence collection. But also of moral concern is the fact that spy robots are frequently armed and can shift very quickly from surveillance to attack. This capability blurs the line between armed conflict and intelligence collection, which raises a range of additional international legal and ethical problems.

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