

IEEE ROBOTICS & AUTOMATION

MAGAZINE

Vol. 18, No. 1 March 2011
ISSN 1070-9932
<http://www.ieee-ras.org/ram>



Robo Ethics

*Defining Responsibility
to Protect Humankind*



Remote-Control Crimes

By Peter M. Asaro

Roboethics and Legal Jurisdictions of Tele-Agency

This article considers some of the potential legal implications of teleoperated robotic systems for enabling action at a distance or tele-agency. In particular, it considers issues that may confront law enforcement as well as issues of legal jurisdiction when tele-agency extends across the traditional physical boundaries of legal jurisdiction.

The legal approach is one of the approaches for the issues faced by roboethics. A consideration of ethics in robotics using the tools offered by the practice of law has been made elsewhere [1]–[3] and has focused on product liability and robots as legal agents. The difficulties of applying the law to some of the possible activities involving new robotic capabilities that may arise in the near future are considered.

One new capability, in particular, is that robotic systems also pose one of the greatest threats of social disruption. This new capability has, however, been largely overlooked by the rather small literature on roboethics, namely, the ability of robotic systems to support action at a distance, known as *tele-agency*. This capability has serious implications for both law enforcement and legal jurisdiction, though tele-agency has received more attention in the art world (e.g., [4], [5]) to date than it has in discussions of robot ethics and law. This essay seeks to correct this by considering some of the legal issues that might arise as teleoperated robots proliferate and spread into consumer markets, international trade, and hacker communities.

Telecrimes and Law Enforcement Issues

Simply put, teleoperated and remotely controlled systems allow the legally responsible actor(s) in control of the system to be spatially (and, in the case of preprogrammed systems, temporally) distant from the effects of their actions, without requiring the support of human accomplices. This has several serious consequences for law enforcement because of the perpetrator's reduced bodily risk, the risk of being arrested in the conduct of a crime, and the difficulties



© BRAND X PICTURES & LUSHPIX

Digital Object Identifier 10.1109/MRA.2010.940154

Date of publication: 14 April 2011

involved in correctly identifying the responsible individuals. These are clearly matters of law enforcement—identifying, apprehending, and convicting the perpetrator of a crime—and do not affect whether or not the perpetrators are guilty of a crime. However, the ability to more easily commit crimes while reducing the risks of facing punishment is certainly a threat to justice and the public good.

While, in theory, there is little legal difference between robbing a bank at gunpoint and using an armed robot to rob a bank, there are significant practical differences. Most obviously, there is a significant difference in the bodily risks assumed by an armed robber and someone controlling an armed robot remotely, which has implications for the use of armed police and security guards as a deterrent to such crimes. Viewed another way, this could have a significant impact on the ability of police and security forces to intervene and stop such crime, especially if they are unable to physically subdue the robotic system. On the other hand, law enforcement could use force against the robot without the same restraint that would be called for if a human body were at risk (even the body of a suspected criminal).

The use of such a remote-robbing robot also requires the police to do additional work to correctly identify and locate the perpetrator of the robbery. If the current state of the art of cybercrimes is a good indication, it will likely be quite difficult to track down the perpetrator of such a crime when their control path has been routed through a series of networks and servers intentionally designed to obscure the identity and location of the criminal. Teleoperation implies the real-time control of a robot from a physical distance. We can, however, also consider a preprogrammed robot as a kind of teleoperation in which the programmer/controller is temporally removed from the actions of the robot, though is still the responsible agent. Again, there are precedents for treating programs as a form of criminal behavior, as is done in the creation and use of illegal viruses and botnets.

Robotic technologies might not prove to be a source for a massive remote-control crime wave, however. Some reasons for this are that, first, in material-property theft, the stolen property must be recovered at some point, and thus the police could track and follow the robot until the perpetrators attempt to retrieve the property. Telerobotic theft is quite unlike cybertheft in this regard, as stolen information can be quickly and easily transferred through the network, while stolen material objects cannot. Second, initially such robotic technologies will be expensive and thus would be unlikely to be used in petty crimes where the value of the stolen goods is less than the cost of losing the robot. Third, like other cybercrimes, these tele-agency crimes might leave data trails that could be used to identify perpetrators, and videofeeds and control commands might actually be recorded by authorities in ways that could be used in courts to prove the guilt of perpetrators. While it is already possible to commit complex cybercrimes, robotic technologies will extend the range of these crimes into the

embodied material world, including bodily violations and violent crimes such as assault, rape, and murder.

Tele-Agency Across Jurisdictions

Complex legal questions may also arise when the perpetrator controlling the system and the robot being controlled are in different legal jurisdictions. Certain interjurisdictional or multijurisdictional actions are already handled by the law in various ways. Examples include using other human agents to conduct a crime, such as in conspiracy or being an accomplice to a crime, though these tend to carry lesser penalties than the actual commission of the crime. In the United States, a crime (e.g., a fraud) that involves actions in two or more different states within the country can result in the matter being settled by the federal court system rather than in the state courts. Prosecutors may also seek convictions for crimes in each state jurisdiction separately, depending on the case and cooperation between state and federal prosecutors. In these cases, there are often similar sets of laws that apply in each jurisdiction, and sometimes one set overrides, such as federal law having precedence over state, provincial, or local laws. More controversial are cases in which there are subtle differences in the definitions of what constitutes the crime in question or when different penalties may apply, depending on the court and jurisdiction in which the trial is held. For example, a first-degree murder in some U.S. states carries a death penalty, but not in others, and so it can matter a great deal where the crime is committed and tried. Indeed, the rules of extradition in some jurisdictions, as in many countries in Europe, are

such that they will not allow the extradition of a suspect for trial in another country in which they might face the death penalty. More generally, extradition requires an international treaty agreement, which usually stipulates that the charges be serious enough to warrant returning an individual, such that many petty crimes committed using robots might not warrant extradition.

The more problematic cases involve activities that are legal in one place but illegal in another. A good example of this is gambling. In most states, gambling is illegal, or at least tightly regulated by the state. With the advent of the Internet, however, it became possible to engage in gambling activities online. The legal question then arose as to where the gambling is taking place. If the gambler and the computer server running the gambling program are both in a jurisdiction where gambling is legal and the activity is properly licensed, then the activity is legal. But is it still legal when the player is in a jurisdiction where it is not

These systems present a new capability for committing violent crimes at great distances that did not exist before.

legal to gamble but the server is? What if two gamblers are betting in the same poker game, but one is in a jurisdiction where it is legal and the other is not? Is one engaged in an illegal activity but the other not, even though they are playing the same game? What if the players are in a legal gambling jurisdiction but the server is not, or the network passes gambling-related data traffic through computers in a jurisdiction where it is illegal? While we could propose simple and consistent legal interpretations, e.g., that what

matters is where the gamblers are, it does not mean that the courts are necessarily free to apply them. They must also weigh issues of public interest, legal precedent, and often, the decisions of other courts, or even the treaties and legal bodies that constitute international law.

The issue of tele-agency and gambling has, in fact, been addressed explicitly, not by a court exactly, but by the dispute-resolving mechanisms of the World Trade Organization (WTO). The WTO is a multiparty

international treaty organization whose rules and decisions are binding upon member nations. In 2003, the small island nation of Antigua petitioned the WTO against the United States for their enforcement of antigambling laws on gamblers within the United States who logged in to computer servers in Antigua to engage in gambling [6], [7]. Antigua argued that the actions of the United States in enforcing those laws hurt their ability to engage freely in trade with a market of gamblers in the United States. As the servers were in Antigua, they argued that the gambling was in Antigua, and the United States was engaged in protectionism by denying those players the opportunity to engage in free trade with legal businesses in Antigua. The United States argued that permitting players in the United States to gamble online undermined their ability to use the law to enforce a public moral interest and to maintain social control within its borders. In 2005, the WTO ruled in favor of Antigua.

In accepting this argument, the WTO effectively legalized online gambling in all WTO member nations, provided that gamblers used computer servers located in a jurisdiction that is a member of the WTO and in which gambling was legal. The effective modifier here is significant, because the WTO is not really a court, and a WTO member nation could still choose to enforce their antigambling laws, though they would be subject to WTO penalties and fines for protectionism, or they could withdraw from the WTO altogether. It is also important to note that the

basis of this decision is not simply that online gambling is legal, because the servers are in Antigua where gambling is legal. This is unlike other precedents in international law for two important reasons. First, because the WTO does not have legal authority beyond its member nations, and thus, its legal decisions do not carry the weight of precedent that, e.g., the decisions of the International Criminal Court would. Second, because the WTO only has authority over international trade, future use of this decision as a precedent would only be applicable in other cases involving free trade and protectionism among member nations.

That said, we can envision a variety of possible scenarios in which an online activity involved the use of teleoperated robotics and was a matter of free trade. That is, where the activity involved would be illegal if it were engaged in locally, but a commercial industry might exist in which people were willing to pay for the opportunity to circumvent local laws through remote teleoperation and thus the WTO decision would apply as a precedent. For example, in 2004, a Texas entrepreneur launched a Web site (www.live-shot.com) that, for a fee, allowed users to log in, aim, and fire a real gun at real targets. His ultimate plan was to provide live animals for a teleoperated hunting business, claiming that this would serve a market of physically impaired hunting enthusiasts who could not go out into the woods themselves [8], [9]. The business and Web site are now defunct, because 11 states including Texas passed laws making online hunting illegal by requiring the hunter to be physically present when hunting.

Interestingly, the Texas law prohibits anyone hunting with a robot within the boundaries of the state but would not necessarily apply to hunters in Texas going online to, e.g., hunt big game in Africa with a robot. If the laws were written so as to prohibit the act of online hunting itself then the online gambling precedent would apply. If the hunting range was set up in Antigua, for instance, and represented a legal and profitable business interest in Antigua, laws prohibiting online hunting in Texas would be unenforceable due to the WTO ruling.

It is worth noting that the morally abhorrent nature of the activity in the gambling case was not sufficient to justify enforcing the local laws over promoting free international trade [6], though perhaps some activities could reach a level of abhorrence that this would no longer be true. The animal hunting case would not seem to rise to such a level. But we could imagine jurisdictions that either lacked certain legal prohibitions or decided to permit certain activities to generate trade revenue by attracting customers wanting to engage in teleoperated activities, precisely because they are illegal or prohibited in the locales where their online customers reside. Because of this, the commercially successful activities are likely to descend toward the questionable and prurient end of the moral spectrum, including sexual acts, violent acts toward animals and humans, or human degradation and torture. This raises a disturbing set of questions: What if there was a jurisdiction

A promising legal concept that might serve to prevent the use of robotic technologies to exploit local differences in legal standards is the universality principle or universal jurisdiction.

willing to sell the opportunity to execute people who have been sentenced to death? or which allowed humans to consent to risking their own lives in mortal combat with teleoperated robots? And, as human slavery remains marginally legal in a handful of countries, would the consent of slave owners be sufficient to decriminalize physical violence up to death against a slave by a robot operator in another country in which such slavery and violence is criminal? In a globalized economy that has already seen banks and multinational corporations establish offices or incorporate in jurisdictions that offer them the greatest protection from taxes or other legal liabilities or restrictions, we should not be surprised when certain locales seek to enrich themselves by becoming safe havens supporting the circumvention of other established legal jurisdictions. Should robotic crimes fall through similar jurisdictional cracks as online gambling and offshore tax havens, we might well see the emergence of some sort of robot safe-havens.

Beyond the economic and trade aspects, there are critical issues of interjurisdictional enforcement as well. Even if it were acknowledged that an illegal act was committed in jurisdiction A, using a robot being controlled by a clearly identified person in jurisdiction B, it is not clear that courts in jurisdiction B would necessarily be able to prosecute the offender. Jurisdiction A would first need the person to be arrested and extradited from jurisdiction B to prosecute them, but not all countries have extradition treaties with each other, and, even where there are treaties, not all crimes warrant arrest or extradition.

A promising legal concept that might serve to prevent the use of robotic technologies to exploit local differences in legal standards, or circumvent prosecution due to jurisdictional gaps, is the universality principle or *universal jurisdiction* [10]. It was famously used by Spanish courts to arrest and charge Augusto Pinochet for crimes he committed as the dictator of Chile, though he never stood trial. However, the justification for applying the principle of universal jurisdiction is that the crimes committed are so heinous that they are crimes against all of humanity, and thus, all courts have the authority to prosecute suspected offenders. It is doubtful that most specific cases involving robots would rise to the level of crimes against humanity. It is also doubtful that Spanish courts (or the Belgian courts that also assert universal jurisdiction) would have an interest in prosecuting tele-agency crimes around the world or have the resources to do so. We might instead imagine that certain specialized courts could be constituted and supported by international treaty organizations, such as the United Nations, or by perhaps expanding the scope of crimes considered by the International Criminal Court. But such a development would likely arise in the face of public outcry in multiple countries at the inability of existing legal structures to reign in a growing number of such crimes.

Conclusions

In summary, the development and use of teleoperated robotic systems will continue to present new difficulties for

the enforcement of local and international laws. These systems present a new capability for committing violent crimes at great distances that did not exist before. Moreover, the ability of tele-agency to separate actors from their actions will further enable the exploitation of inconsistencies between the legal standards of different jurisdictions. These legal issues are likely to be exacerbated by recent developments in international trade and globalization. There are some counterweights to these rather bleak possibilities however. First, robots only provide a margin of anonymity to their controller and not complete anonymity. Second, there are fundamental asymmetries in tele-agency, such that information can be transmitted in both directions, but material entities and properties are stuck on the effector end of the robotic system. Finally, the jurisdiction issues could be addressed by international courts or universal jurisdiction, but the establishment of such courts is unlikely, and most cases of telerobotic crimes will fail to rise to the current high standards set for universal jurisdiction.

References

- [1] P. M. Asaro, "What should we want from a robot ethic?," *Int. Rev. Inform. Ethics*, vol. 6, no. 12, pp. 9–16. Reprinted in R. Capurro and M. Nagenborg, Eds., *Ethics and Robotics*. Amsterdam, The Netherlands: IOS Press, 2009, pp. 1–10.
- [2] P. Asaro. (2007, Apr. 14). Robots and responsibility from a legal perspective. *Proc. IEEE Conf. Robotics and Automation Workshop on Robotethics*, Rome, Italy [Online]. Available: <http://peterasaro.org/writing/ASARO%20Legal%20Perspective.pdf>
- [3] P. M. Asaro, "A body to kick, but still no soul to damn: Legal perspectives on robotics," in P. Lin, K. Abney, and G. Bekey, Eds., *Robot Ethics: The Ethical and Social Implications of Robotics*. Cambridge, MA: MIT Press, to be published.
- [4] K. Goldberg, Ed. *The Robot in the Garden: Telerobotics and Telepistemology in the Age of the Internet*. Cambridge, MA: MIT Press, 2000.
- [5] E. A. Shanken, "Tele-agency: Telematics, telerobotics and the art of meaning," *Art J*, vol. 59, no. 2, pp. 64–77, Summer 2000.
- [6] T. Madger, "Gambling, the WTO, and public morals: A short review of Antigua versus the United States," *Televis. New Media*, vol. 7, no. 1, pp. 52–67, Feb. 2006.
- [7] Antigua On-line Gambling Association. [Online]. <http://www.antiguawto.com/WTODispPg.html>
- [8] J. Cummings. (2004, Nov. 23). Click-bang! Online hunting faces hurdles: Inventive hunter hopes to give new meaning to 'point and shoot.' *NBC News* [Online]. Available: <http://www.msnbc.msn.com/id/6568977/>
- [9] M. Matthew. (2005, Sept. 28). State lawmakers bag online hunting. *Stateline.org* [Online]. Available: <http://www.stateline.org/live/Viewpage.action?siteNodeId=Id56691>
- [10] K. C. Randall, "Universal jurisdiction under international law," *Texas Law Rev*, vol. 66, no. 4, pp. 785–842, 1987.

Peter M. Asaro, Department of Media Studies and Film at the New School University, New York, NY, 10011, USA. E-mail: asarop@newschool.edu. 