

The grim reality of robots at war

Noel Sharkey gives a stark warning about the potential for a robot arms race.

The deployment of armed robots in Iraq is the latest step on a dangerous path into a 'brave new world' where robots decide who, where and when to kill. South Korea and Israel have both deployed armed robot border guards, while other nations – including China, India, Russia, Singapore, and the UK – increasingly use military robots. They are integral to the massive US\$230 billion Future Combat Systems project to develop unmanned vehicles that can strike from the air, under the sea and on land. The US congress want one-third of ground combat vehicles unmanned by 2015¹. Over 4,000 robots are serving in Iraq at present², with others in Afghanistan – and now they are being armed (see picture).

Most robots currently in combat are extensions of human fighters who control the application of lethal force. When a semi-autonomous MQ-1 Predator self-navigated above a car full of al-Qaida suspects in 2002, the decision to vaporise them with Hellfire missiles was made by pilots 7,000 miles away. Predator attack-planes have flown many missions since then with inevitable civilian deaths, yet working with remote-controlled or semi-autonomous machines carries only the same ethical responsibilities as a traditional air strike.

But fully autonomous robots that make their own decisions about lethality are high on the US military agenda. The US National Research Council advises "aggressively exploiting the considerable warfighting benefits offered by autonomous vehicles"³. They are cheap to manufacture, require fewer personnel and, according to the navy, perform better in complex missions. Thus one battlefield soldier could start a large-scale robot attack in the air and on the ground.

This is dangerous new territory for warfare. Having worked in artificial intelligence (AI) for decades, the idea of a robot deciding on human termination terrifies me. Policymakers seem to have an understanding of AI that lies in the realms of science fiction and myth. A recent US Navy document

suggests that the critical issue is for autonomous systems to be able to identify the legality of targets. Their answer to the ethical problems is simply, "Let men target men" and "Let machines target machines". In reality, a robot could not pinpoint a weapon without pinpointing the person using it or even discriminate between weapons and non-weapons. A child in an urban war zone could be

legitimate targets, we should proceed now regardless of collateral casualties.

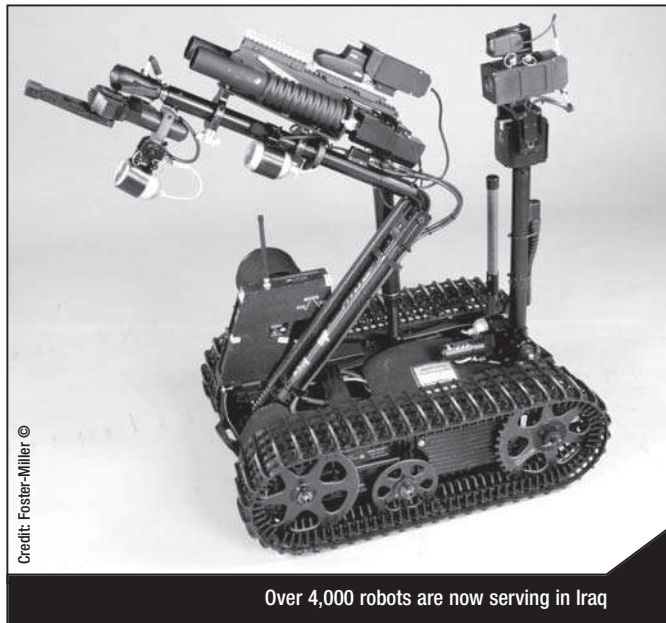
The laws of war enshrined in the Geneva and Hague conventions and the various protocols legislate soldiers' behaviour in armed conflicts – what they should and should not do and who and what their legitimate targets can be. And there are specific laws to deal with the use and prohibition of weapons. But autonomous robots are a special case unlike any weapons before them. They fall foul of three of the fundamental ethical precepts of a 'just war': they are not under control of the chain of command; they cannot reliably discriminate between combatants and non-combatants; and there is no quantitative measure that a robot could use to objectively determine needless, superfluous or disproportionate suffering. Additionally it is difficult, if not impossible, to allocate responsibility for fatal mishaps. The robot might absurdly get blamed or it might be tricked by the enemy into wrongful killing.

We are going to give decisions on human fatality to machines that are not bright enough to be called stupid. With prices falling and the technology becoming easier, we are beginning to see a robot arms race that will be difficult to stop. We will get little warning of the deployment of autonomous robot weapons. It is likely to happen piecemeal and leave us sleepwalking into an unprecedented ethical and moral minefield. It is imperative that we have international discussion and legislation about how, where and when autonomous robots can be applied in war before it is too late.

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References

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2. Osborn K. (2007). *Robotic FX gets army \$280M bomb detector contract*. Defense News, 14 September.
3. National Research Council (2005). *Autonomous vehicles in support of naval operations*. Washington DC: The National Academies Press.



Credit: Foster-Miller ©

Over 4,000 robots are now serving in Iraq

zapped because she points her ice cream at a robot to share. A robot could be tricked into killing innocent civilians.

A different approach being considered by the US Army is to equip the robot soldiers with an artificial conscience that allows them to make ethical decisions about the application of lethal force. But I have grave doubts about the outcome. Apart from an inability to make the appropriate discrimination between innocents and combatants in the fog of war, robot warriors could have to make decisions in very complex and entirely unpredictable circumstances. The number of possible moral and ethical problems in a military operations environment laden with civilians could approach the infinite. Many different events can occur simultaneously, giving rise to unpredictable or chaotic robot behaviour.

I am concerned that military public relations will use the promise of projects like the 'artificial conscience' to allay opposition to the premature use of autonomous weapons. Arguments would follow the technological imperative that because it will soon be possible to have smart robots that can discriminate