

Chapter 114

Military Robots and the Question of Responsibility

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ABSTRACT

Most unmanned systems used in operations today are unarmed and mainly used for reconnaissance and mine clearing, yet the increase of the number of armed military robots is undeniable. The use of these robots raises some serious ethical questions. For instance: who can be held morally responsible in reason when a military robot is involved in an act of violence that would normally be described as a war crime? In this article, The authors critically assess the attribution of responsibility with respect to the deployment of both non-autonomous and non-learning autonomous lethal military robots. The authors will start by looking at the role of those with whom responsibility normally lies, the commanders. The authors argue that this is no different in the case of the above mentioned robots. After that, we will turn to those at the beginning and the end of the causal chain, respectively the manufacturers and designers, and the human operators who remotely control armed military robots from behind a computer screen.

INTRODUCTION

Although the use of unmanned systems is still in its infancy in most armed forces, some militaries, especially those of the US and Israel, have developed and deployed highly advanced drones. Even though the majority of these unmanned systems used in operations today are unarmed and mainly used for reconnaissance and mine clearing, the increase of the number of armed military robots, especially airborne ones, is undeniable. Certainly,

on the face of it, unmanned systems have some strong benefits that could reduce the number of ‘unfortunate incidents’ on the battlefield. To start with, the main causes of misconduct on the battlefield: frustration, boredom, and anger are diminished.¹ What’s more, these unmanned systems have no instinct of self-preservation, and are able to hold their fire in critical situations. On the other hand, the use of robots raises some serious ethical questions. For instance, under what circumstances, and to what extent, do we allow

robots to act autonomously? What precautions should (and can) we take to prevent robots from running amok? Would the use of military robots not be counterproductive to winning the hearts and minds of occupied populations, or result in more desperate terrorist-tactics given an increasing asymmetry in warfare? (See for an overview Lin, Bekey, and Abney, 2008; Lichocki, Kahn, and Billard, 2011; Olsthoorn and Royakkers, 2011). A particularly pressing question is what to do when things go wrong: who, if anyone, can be held morally accountable *in reason* for an act of violence that a) involves a military robot; and b) would normally be described as a war crime?

The answer to that latter question depends on the answer to a prior one: when is there reasonable ground to hold an agent morally responsible for a certain outcome in the first place? Following Fischer and Ravizza (1998) on moral responsibility, we will assume here that agents can only in reason be held responsible if they are *moral* agents, that is, persons (or organizations) who have *control* over their behavior and the resulting consequences. This means that agents can be held responsible for a certain decision only insofar as they have been able to make it *in freedom* and *knowingly*. The first term means that it is not reasonable to hold agents responsible for actions or their consequences if they were not coerced or under duress. The second term, 'knowingly,' has an important normative aspect in that it relates to what people should know, or can with reason be expected to know, with respect to the relevant facts surrounding their decision or action.²

According to some authors (Asaro, 2007; Sparrow, 2007; Sharkey, 2008), the use of armed military robots makes the attribution of responsibility problematic, as it is not sufficiently clear who can be held responsible for civilian casualties and other collateral damage that result from the use of military robots, whether by mechanical error or failing judgment. Is it the designer/programmer, the field commander, the robot manufacturer, the robot controller/supervisor, or the nation that com-

missioned the robot? The answer to that question depends on a number of factors. For instance, was the cause a programming error, a malfunctioning, an accident, or intentional misuse? Or did the procedure include a 'man-in-the-loop,' that is, an element of human control, or was the military robot a fully autonomous or even learning machine?

As to that last question, this paper distinguishes between non-autonomous robots, autonomous (but non-learning) robots, and learning robots. To start with the latter, learning robots are able to develop new behavioral patterns without human intervention; these robots are able to go beyond the parameters they left the factory with, as the robot itself can change them in its interaction with the operating environment (Matthias, 2004). An example is a system that was developed for the automatic diagnosis of lung cancer, and which is able to learn to identify cancer cells on the basis of microscope images of specimens of needle biopsies obtained from the bodies of the persons to be diagnosed (Matthias, 2004). More learning systems are in development, and most of them will pose no moral problems. But this would be different in the case of lethal military learning robots: seeing that it will often be impossible to predict the future behavior of these robots, it is hard to see how one could have sufficient *control* over their actions, which in its turn makes it difficult to determine who can be held responsible with reason.

Learning military robots still lie in the distant future, and this article therefore focuses on the moral issues concerning the at present more relevant categories of non-autonomous and autonomous non-learning armed military robots already or soon to be deployed.³ The main difference between autonomous and non-autonomous robots is that non-autonomous ones require that human operators authorize any decision to use lethal force, that is, they require a 'man-in-the-loop.' This means that the decision to open fire, or more in general, the taking of any action that could threaten human life, is to be considered and

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