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## **A Study of Military Technopolitics: The Controversy of Autonomous Weapon Systems**

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## ABSTRACT

*In recent years, the accelerating development of autonomous weapon systems (AWS) and so-called 'killer robots', has raised a number of legal and ethical concerns in the international community, including questions of compliance with international law and the principles of Just War. At the same time, governments and military services hope to introduce game-changing military technologies that are 'better, faster and cheaper', investing heavily in research and development of AWS. In this paper, I wish to map the different and competing practices of critique and justification that shape the technopolitical controversy of AWS, showing its complexity and internal contradictions. In addition to identifying the dominant regimes of justification, that organize the discourse of AWS, I argue that the military bureau and its officeholders become technopolitical mediators and translators of risk in an emergent practice of jurisprudence, referred to as 'hybrid law', allowing the simultaneous application of a plurality of conflicting legal, ethical, political and economic rationalities.*

In contemporary hybrid, multidimensional and networked battlefields, autonomous and automated technologies are used to support and augment human capabilities in all domains of operation. According to US Deputy Secretary of Defense Bob Work, the development of increasingly intelligent and autonomous weapon systems (AWS) will secure NATO's military superiority, also dubbed the 'Third Offset Strategy'. "The third offset's initial vector is to exploit all the advances in artificial intelligence and autonomy and insert them into DoD's battle networks to achieve a step increase in performance that the department believes will strengthen conventional deterrence" (Work 2016).

Whereas the First Offset of the 1950's was based on US nuclear deterrent and the Second Offset of the 1970's was based on precision guided munitions, the Third Offset will be characterized by human-machine collaboration and combat teaming with unmanned systems performing tasks with varying degrees of autonomy in different domains and in different functions. This is also referred to as multi-domain battle management networks or C4I (Command, Control, Communications, Computer and Intelligence) networks.

However, the use of lethal autonomous weapons that identify and engage targets without human intervention raises important questions for warfighters and policy makers, including questions about military ethics and command responsibility. As I will illustrate in the following, the introduction of AWS in military operations has spurred a technopolitical controversy including a number of ethical, political and legal concerns such as the attribution of responsibility to 'killer robots', risks of proliferation, systems malfunction, programming errors and cyberattack. In this dispute, a number of NGO's such as Amnesty International, Human Rights Watch and Campaign to Stop Killer Robots fight for a preemptive ban of AWS. On the other hand, governments and military services hope to develop 'game-changing technologies' that can react faster, endure longer, operate with less risk to human combatants and simultaneously reduce the costs of war (Hoffman et al. 2016). This technological transformation is often referred to as a 'revolution in

military affairs' or simply RMA. The proponents of the RMA identify precision-strike, shortened decision cycles and vastly increased information and coordination in hybrid human-machine networks as key factors in a new form of multi-domain warfare. Critics however, contend that the RMA is promising a remote-controlled, high-tech, airborne war that makes war seem risk-free, but is in fact lowering the threshold for resorting to war (Vedby 2006).

When governments and generals are promoting AWS, they draw heavily on the strategic narrative of the RMA, while the opponents of AWS refer to international conventions and the ethical and legal principles of the Just War tradition. From the perspective of RMA, the risk is losing military and technological superiority. From the perspective of the Just War tradition, the risk is losing moral and legal legitimacy. Thus, the controversy comes to a grinding stalemate, because the benefits and risks of AWS is being evaluated and tested from fundamentally different and opposing principles of justification: On the one hand a functional principle of (military) dominance and on the other hand a normative principle of (human) equality. Two radically different criteria of justification and evaluation that produce seemingly incompatible risk discourses of AWS.

Another major obstacle in the discussion has been the many different usages and meanings of the word 'autonomous'. The somewhat hypothetical discussions of the future risks of emerging, but not yet fully developed autonomous robot technologies combined with the highly technical language of engineers, programmers, military operators and legal experts contribute to the complexity of the controversy and hence to the difficulty of reaching common definitions, policies and guidelines in the international community. In spite of these complications, many experts agree, that the word "autonomous" is meaningless without specifying the task or function being automated. There are many different ways in which autonomy can be employed in military systems and any given machine might have humans in complete control of some tasks and might autonomously perform others.

Hence, instead of referring to autonomy as a characteristic of the system *per se*, I will use the concept of *hybrid networks* to characterize cooperative networks of human operators and machines with autonomous functions. As I will argue in the following, risk management in hybrid (C4I) networks should be seen as a context specific collaboration – or an *intelligent partnership* - of humans and machines.

The purpose is not to reach universal conclusions or recommendations for or against certain types of AWS based on a single regime of truth or justification. Instead, I will adopt a second order perspective on both the critiques and justifications in the technopolitical controversy of AWS. This calls for a discursive theoretical framework, I term as *military technopolitics*.

## **THE STUDY OF MILITARY TECHNOLITICS**

A basic assumption in military technopolitics is that material artifacts are not just neutral instruments, but actively co-shape human perceptions and actions. They are not just passive objects, but active mediators of the relationship between people and reality. As such, they also

become mediators and co-producers of risk, risk perception and risk management in all domains of the battlefield. The term ‘technopolitics’ then serves to address the way technologies constantly involve the negotiation of meaningful human action and decision-making in the operative, administrative and political risk environment. Studying military technopolitics is a way to map the controversies and compromises associated with disputes of legitimacy, security, risk and responsibility. As such, the concept of military technopolitics refer to competing strategies of critique and justification that associate the idea of good and just *conduct of war* with the idea of good and just *conduct of governance*.

The central concepts of controversy, critique and justification are adopted from the sociology of Luc Boltanski & Laurent Thévenot (2006). They distinguish between six (and later seven) regimes of justification, that have emerged in the philosophical tradition (see figure 1. below). Each regime refer to its own specific principles of quality and its own order of worth. Each regime has its own internal logic or ‘economy’ of justice, so to speak. The regimes are constituted in mutual opposition to one another: What is just and worthy in one regime, is unjust and unworthy in another regime.

In situations of disagreement, different actors have the ability to invoke a plurality of regimes and criteria of justification in order to gain acceptance of their argument or to criticize their opponents. This ability to apply different principles of justification in different situations and to engage in critical tests of legitimacy, is what Boltanski & Thévenot calls the *critical capacity* of ordinary people. The critical capacity is required to pass judgement and to make sound and prudent decisions in everyday life as well as in political tests of legitimacy. The study of technopolitical controversies then, is a study of practical judgement and the way different actors constantly use their critical capacity to translate between a plurality of different ‘worlds’ and regimes of justification.

**Fig. 1. Regimes of justification/economy of worth**

|                      | Principles of justification | State of worth  |
|----------------------|-----------------------------|---|
| Inspirational regime | Creativity, empathy         | To be passionate, innovative and inspired                           |
| Domestic regime      | Authority, hierarchy        | To be loyal and trustworthy by representing traditional values      |
| Civic regime         | Collectivity, legality      | To represent the collective will through transparent rules and laws |
| Industrial regime    | Efficiency, productivity    | To be productive following measurable standards                     |
| Market regime        | Competition, opportunism    | To be competitive, economical, opportunistic                        |
| Opinion regime       | Fame, success               | To be successful, visible and win public recognition                |
| Project regime       | Flexibility, adaptability   | To be flexible, agile, responsive                                   |

More specifically, the study of military technopolitics serves to explore the ways in which competing regimes of justification and “riskification” (Hardy & Maguire 2016) produce their own risk identities, constituting the human and non-human subjects and objects of risk (such as allies and adversaries, committees and delegates, military personnel and materiel, public media, legal experts, internal reviews, joint doctrines etc.). In addition, myriad practices are involved in organizing risk, such as, intelligence gathering and analysis, threat assessment, campaign planning, after action review, probability and statistical techniques, calculating risk-benefit ratios, simulations, monitoring for early warnings, auditing, accident or incident reports, ‘lessons learned’ etc. These interrelated identities and practices are the means by which actors organize and ‘normalize’ risk, i.e. turn unpredictable and uncontrollable hazards into knowable and manageable risks (Beck, 1992, Lupton 2013).

In this context, attention is drawn to the practice of justification and riskification of autonomous military technologies, including the professional practice of network battle management in multi-domain command and control (C4I) grids. For this purpose, I define risk management as the perception, evaluation, organization, normalization and communication of risk in networks of humans and machines. Thus, in a technopolitical perspective, risk management is a result of human-machine interaction and co-shaping of critical decisions in all domains of operation (Saarilouma 2015).

The study of military technopolitics then designates a critical inquiry of the human and technological coproduction and distribution of risk in decision-making processes. In this perspective, risk is something continuously negotiated, translated and mediated in actor-networks of persons and things. Thus, with the concept of military technopolitics, I place the discussion firmly in the tradition of actor-network theory and the sociology of critical capacity by Boltanski & Thévenot. From this position, I will address the way different and competing practices of critique and justification shape the technopolitical controversy of AWS.

First, I will map the key arguments of critique and justification of AWS presented in the international community. The map will not be exhaustive, let alone authoritative, but provides an overview of the major fault lines and contentions in the discussion. Secondly, I will elaborate on the role of governmental officeholders and military operators as technopolitical translators and mediators of risk. Finally, I will present the emergent practice of ‘hybrid law’ as a response to the ‘legal irritation’ of hybrid networks such as cooperative teams of humans and machines with autonomous functions.

## **MAPPING THE TECHNOPOLITICAL CONTROVERSY**

As a central actor in the controversy of AWS, NATO HQ SACT published a policy guidance addressing “The Role of Autonomous Systems in Gaining Operational Access” in 2014. The aim of the guidance is to “facilitate planning and preparation for the design, procurement and operation of systems with autonomous capabilities, and to realize the impressive benefits while avoiding potential challenges” (HQ SACT, 2013-14). In the report it is stated that the benefits of new autonomous

technologies are coupled with complex legal and ethical concerns and that increasing autonomy in military systems is likely to have wide-ranging implications and risks, requiring changes in the nature of planning and conduct of operations, organizational structures, command and control, and personnel training and skill sets (ibid.:6). Thus, the emergence of AWS is presented as a game-changing technology shaping the future battlespace and the organization and management of risk. As US Deputy Secretary of Defense Bob Work puts it, the offset strategy includes technological leaps, but it's really about operational and organizational constructs based on doctrine, training and exercises that allow the joint force to operate with such technologies. "It's also institutional strategy about how we're organizing the entire Department of Defense to compete in this new dynamic environment" (Work 2016). In this argument, both the *domestic* and the *market regime* of justification is represented, referring to the importance of institutionalized doctrines, structures and procedures as well as the requirements of the competitive global security environment.

According to military expert and scholar Paul D. Scharre, increasingly intelligent and autonomous systems have the potential to play a key role in military operations. In complex battlefields, weapon systems with autonomous functions will allow military forces to operate with greater coordination, intelligence and speed: "Software-based autonomous systems will help warfighters sift through massive amounts of data, shortening decision cycles and accelerating responses to enemy movements" (Scharre 2015:4). Furthermore, increasing autonomy in military systems will allow humans and machines to cooperate in hybrid teams or networks promoting a shift from a conventional warfighting paradigm in which one person controls one vehicle, to a "swarm paradigm", in which one person controls many vehicles at the mission level (ibid.). In this approach, the *project regime* of justification is most prominent, stressing the enhanced flexibility and responsiveness of human-autonomous machine teaming.

In agreement with this view, the U.S. Department of Defense stresses that the employment of autonomous systems will not only increase efficiency, speed and precision in military operations, but also reduce the costs of warfare. As stated in the DoD Research and Engineering Community: "Autonomy can provide DoD tremendous value by enhancing the performance of military systems, decreasing risk to U.S. warfighters, and generating cost savings" (Office of Technical Intelligence 2015:21). In this passage, a plurality of justifications are invoked. In addition to the justifications of the *market regime* referring to expected cost savings and the *domestic regime* stressing the reduction of risk to warfighters, the *industrial regime* is strongly emphasized focusing on the enhanced military performance of AWS.

Thus, a primary justification of the use of autonomous weapons is the assumption that such systems will not only require fewer human combatants at lower costs and reduced risk, but also increase speed, intelligence and flexibility in military operations. In short, according to this type of justification, automated systems should work 'faster, better and cheaper'.

However, according to a group of researchers and experts in autonomous systems, this justification is fundamentally flawed. In a radical critique of the "myth of automation", they state

that: “Automation does not necessarily reduce manpower requirements in either the quantity or quality of trained personnel needed to employ a weapon system effectively. On the contrary, automation can increase the importance and number of people who design, program, guide, and supervise automated systems” (Hoffman et al. 2016.:5). The fundamental misconception, they argue, is the myth that automated systems are independent of human operators: “Automation can facilitate varying degrees of self-directedness and self-sufficiency for components of the system in specific contexts, but *interdependence* defines the relationship between the human and machine elements of the weapons” (ibid.). In this argument, the critique is directed against the ‘better, faster, cheaper’ rationality of the *market* and the *industrial regime*. This, according to Hoffmann et al., in fact misses the central issue of human-machine interaction and interdependence.

The interdependence that characterizes the relationship between humans and machines in hybrid networks raises the question of how to incorporate “meaningful human control”, i.e. the judgment of responsible commanders and experienced operators, in the design and algorithms of the system. This is especially challenging because appropriate levels of human judgement are dynamic and negotiated among components of the system, both in battle and over the entire life cycle of a weapons program (ibid.:6). As a consequence, they argue, what is saved by replacing human warfighters in the battlefield is more than outweighed by the requirement of highly specialized designers, programmers and operators in the control room. As emphasized by Hoffman et al.: “Control of increasingly advanced and automated technology often requires greater understanding, training and proficiency – not less” (ibid.:3).

In this argument, we find the critique coming from the *inspirational regime* with a focus on innovation, creativity and empathy in the incorporation of ‘meaningful human control’, as well as the *industrial regime*, with a strong focus on professional skills and expertise.

Following this critique, a central aspect of risk management and the exercise of ‘meaningful human control’ is the understanding of Human Autonomous Systems Interaction (HASI) processes. This includes the design, programming and coordination of multidimensional human-machine interfaces or so-called “dialogues” between the technical artifact – machine, platform or program – and the human user (Saariluoma 2015:234-35). According to this view, the ability to translate highly specialized semiotic codes and detect critical cues or ‘events’ in the information environment, will be key to creating high-level situational awareness and accelerated responsiveness in hybrid networks.

However, turning to some of the most prominent actors in the technopolitical controversy of AWS, we find the opposing positions clearly demarcated. According to Noel Sharkey, spokesperson in the ‘Campaign to Stop Killer Robots’: “[T]he ethical problem is that no autonomous robots or artificial intelligence systems have the necessary skills to discriminate between combatants and innocents” (Sharkey 2008:87). On the other hand roboticist Ronald C. Arkin argues that an ethical robotic warfighter can be designed and programmed to “not only comply with the restrictions of international law, but in fact outperform human soldiers in their ethical capacity” (Arkin 2010:339).

Furthermore, he continues, unethical behavior and war crimes committed by human warfighters can be avoided by robotic systems simply because unlike humans, machines are not affected by feelings of anger, stress, revenge, pain, fatigue, insecurity or despair and thus are less likely to act in irrational or unlawful ways. Here we find contradicting arguments within the *civic regime*, both referring to lawful conduct and compliance with the principle of discrimination. They both acknowledge the basic legal and ethical premises of Just War, but they disagree on whether or not AWS are able to adhere to them and hence, if the use of AWS can be justified or not.

As the conflicting arguments in the controversy indicate, the central point of dispute is the transfer of decision authority from human operators to autonomous systems and the determination of which tasks and which responsibilities should be delegated to machines and which to people (Theunissen & Suarez 2015:170). In order to be ethically and lawfully deployed, it is argued, autonomous weapons would need to be able to reliably calculate collateral damage costs, which is difficult even for humans to do (Mayer 2015:74).

The central legal and ethical concerns in the controversy of AWS can be summarized as follows:

*The threshold problem:* Is the threshold of war lowered, i.e. will war be the “easy solution” instead of the “last resort”, if new technologies make warfare both cheaper and more risk-free?

*The discrimination problem:* Will autonomous military robots be able to discriminate between legitimate and illegitimate targets? Will the distinction between combatants and non-combatants be more difficult to draw in “remote-controlled wars”? Who makes the decision and how should they be trained/programmed?

*The proportionality problem:* How should the principle of proportionality be applied to e.g. drone attacks? What are the criteria for military success? Can we even classify hybrid network warfare as “war” in a traditional sense?

*The responsibility problem:* Who can be held ethically and legally responsible for unlawful conduct or malfunctions in autonomous systems? Are the existing principles for Just War adequate?

*The problem of ethical blow-back:* How is the risk of adversaries targeting the civilian population at home and in theater evaluated and justified?

Mapping the different critiques and regimes of justification presented in the controversy of AWS, we see that a major fault line emerges between the industrial principles of increased efficiency, speed and precision (RMA narrative) on the one hand and the civic principles of lawfulness, equality and transparency (Just War narrative) on the other hand. However, principles of justice and worth from all seven regimes are represented, illustrating the complexity and inherent instability of the discourse (see figure 2. below).

**Fig 2. Critiques and justifications in the controversy of AWS**

| <b>Controversy of AWS</b> | <b>Justifications</b>   | <b>Critiques</b>  |
|---------------------------|---|---|
| Inspirational regime      | Innovative, future oriented technology, increased learning and creativity, transcendence of classical distinctions      | No empathy in AWS, remoteness, objectification of human subjects, uninspired, 'mechanistic' approach                                  |
| Domestic regime           | Protection of troops and national interests, surveillance and control of irregular activities                           | Delegation of authority to non-human autonomous systems, blurring of distinctions and hierarchic order in hybrid networks             |
| Civic regime              | Reduced collateral damage, non-lethal options, precautionary measures, more ethical than humans                         | Non-compliance with IHL and LOAC, threshold problem, risktransfer to civilians, unethical, asymmetrical warfare, autonomous arms race |
| Industrial regime         | Efficiency, precision, speed, resilience, reliability, 'dull, dirty and dangerous jobs', increased machine intelligence | Risk of system malfunction, programming errors, cyber attack  |
| Market regime             | Reduced costs of war, strategic opportunities, 'trade off', niche specialization  | Proliferation to adversaries  |
| Opinion regime            | Military and technological superiority the 'Third Offset Strategy'  | Difficult to win 'hearts and minds'   |
| Project regime            | Flexibility, adaptability, temporary, modular network organisations, acceleration                                       | Rigid, rulebased machine programming, non-holistic linear problemsolving  |

**Fig. 3. Subjects and objects of 'riskification'**

| <b>Controversy of AWS</b> | <b>Subjects/objects of 'riskification'</b>  |
|---------------------------|---|
| Inspirational regime      | The military corps d'esprit, 'warrior ethos', empathy and authenticity                                |
| Domestic regime           | "Meaningful human control", national security, terrorist attacks against home population              |
| Civic regime              | International conventions, legal procedures and reviews, officeholders, lawyers, civilians, warcrimes |
| Industrial regime         | Military personnel and materiel, engineers, machines, algorithms, system malfunctions                 |
| Market regime             | Military budgets, acquisitions, supply and demand of emergent technologies, clients, economy          |
| Opinion regime            | Politicians, media, citizens, international community, scandals                                       |
| Project regime            | Bureaucratic and industrial deceleration, regulation  |

## **MILITARY TECHNOPOLITICS AND THE ETHICS OF OFFICE**

Ultimately, some of the most important issues regarding AWS are ones of operational risk and military ethics: “Increased autonomy in the use of force goes right to the heart of the essence of the military profession: expertise in decisions about the application of force in war” (Scharre 2015:16). What should be stressed is that professional decisions about the application of force in war, including the incorporation of AWS, are never based solely on the judgement of the individual warfighter. In order to be lawful, the use of any kind of weapon will be restricted according to a set of international conventions and principles for legitimate and just conduct of war, e.g. the Laws of Armed Conflict (LOAC) and International Human Rights Law (IHRL).

The application of these principles is politically mandated and implemented through military doctrines and professional ethics. As Mark Roorda points out: “No weapon should be regarded as a single entity operating in a vacuum. Nor is adherence to relevant norms only realized during execution. Humans will determine what type of system to launch for what type of mission, and under what circumstances. It is this decision and the planning considerations that inform it, which is essential to constrain the use of force and to ensure that operational and legal requirements are met” (Roorda 2015:154).

However, even with human operators in control of decisions, lawful conduct is not guaranteed. Any weapon can be used unlawfully. This is the reason why adherence to professional ethics and compliance with legal principles forms the basis of risk management in both the operative, administrative and political dimension of the battlefield. As stated by Scharre: “How militaries incorporate autonomous systems into their forces will be shaped in part by strategic need and available technology, but also in large part by military bureaucracy and culture” (Scharre 2015:18).

In other words, bureaucratic procedures and professional ethics are key factors in shaping the technopolitical discourse. This is particularly well documented in political disputes of expensive military budgets, where officeholders serve as moderators of political enthusiasms and industrial interests. The legal-rational, rule governed and sometimes cumbersome bureaucratic procedures are an essential part of democratic control and prudent political decision making processes. But, in an age of exponential technological acceleration, governmental and military bureaucracies, often operating with 20-or 30-year timelines in the development and acquisition of new weapon systems, are left at an inherent disadvantage in keeping pace with rapidly advancing technologies. At the same time, the political demand for a more flexible and “responsive” bureaucratic administration challenges political transparency and democratic debates of Just War. As Paul Du Gay remarks in a critique of contemporary programs of “enthusiastic” and “responsive” public management, the bureaucratic ethos must in important respects be *unresponsive* to political enthusiasms:

“While it is easy to see how such an ethos can be viewed by politicians as a license to obstruct, it was, until recently, generally considered indispensable to the achievement of responsible (as opposed to merely “responsive”) government, because it was seen to balance and even complement political will” (Du Gay, 2008:349).

In other words, the meticulous and prudent ethos of the bureau intended to keep volatile political interests and public sentiments in balance, is increasingly politicized and outplayed by the accelerating pace of technological development.

This consideration of the professional ethics of office and the military bureaucracy as mediators and organizers of risk becomes even more urgent when applied to political decisions of war and the use of armed force. Thus, I argue, the role of military advisors and officeholders as mediators and ‘translators’ of a plurality of opposing ethical, legal, political and economic rationalities calls for a framework of military technopolitics that includes the bureaucratic ethos and its practices of risk organization and normalization. The importance of military and bureaucratic risk mediation has been remarkably absent in the discourse of AWS, considering the efforts in the international community to reach agreement and common policies on the use and regulation of AWS. As I will show in the following, one reason for this could be the inadequacy of the applied concept of intentionality and agency in the dispute.

## **DISTRIBUTED INTENTIONALITY AND INTELLIGENT PARTNERSHIPS**

In the controversy of AWS, the focus has mainly been on the implications of transferring decision authority and hence responsibility from humans to machines: What are the inherent risks and benefits and how do warfighters and political decision-makers manage them?

Until now, the discussion has been characterized by a divide between on the one hand a functionalist approach, where AWS are simply tools designed to do something, and if they fail to do so properly, they were either badly designed, malfunctional or not operated correctly (Verbeek 2006:2). In this view, it is not the autonomous weapon in itself, which is unlawful. Only the way it is used by humans in specific situations and against specific targets can be unlawful, just like any other weapon.

On the other hand, we find a legal and ethically informed approach, viewing AWS as fundamentally challenging existing conventions and principles of international law. In this view, AWS are inherently unlawful, inasmuch as they can target and engage autonomously, but do not have the necessary capacity to distinguish between combatants and non-combatants and adapt to rapidly changing environments.

At the heart of these discussions, however, lie two equally reductionist assumptions: An assumption that reduces technologies to passive material objects and an assumption that reduces morality to human actions. What they both fail to take into account is how technologies mediate and co-shape the perceptions and practices of their human users. In a technopolitical perspective on risk management in hybrid networks both of these reductionist assumptions are avoided by attributing intentionality and agency to both humans and machines (Latour 1994). Artifacts – such as autonomous weapons – mediate perception by means of technological *intentionalities* or ‘directories’ in their design. In other words:

“Artifacts are active: they help to shape human actions, interpretations and decisions, which would have been different without the artifact... The intentionality of artifacts is to be found in their directing role in the actions and experiences of human beings. Technological mediation therefore can be seen as a specific, material form of intentionality” (Verbeek 2006:10).

Thus, in the framework of technopolitics, human-machine interfaces in hybrid networks are seen as collaborative *scripts* or programs for action and interpretation, including the perception and management of risk. Thus, moral decision-making is seen as a joint effort of human beings and technological artifacts. It is, in other words, an “inherently hybrid affair, involving both human and nonhuman intentions, or better ‘composite intentions’ with intentionality distributed over the human and the nonhuman elements in human-technology-world relationships. Rather than being derived from human agents, this intentionality comes about in associations between humans and nonhumans. For that reason, it could be called ‘hybrid intentionality’” (ibid.:11).

When intentionality and decision making is seen as a coproduction of human and non-human actors, the ethical and legal concerns about the lawful use autonomous weapon systems is not a question of delegating decision authority and attributing responsibility to *either* humans *or* machines. Instead, risk management in cooperative hybrid networks is seen as an intelligent partnership of humans and machines, continuously mediating and co-shaping the technopolitical discourse and its subjects and objects of riskification. Attributing intentionality and agency to hybrid *networks* rather than individual human actors however, has profound implications for the legal regulation of autonomous technologies in general and for AWS in particular. The challenge, according to legal scholar and sociologist Günther Teubner, lies in the paradoxical nature of hybrid networks:

“Networks are confronted with the problem of how to translate contradictory [legal, ethical, political etc.] demands into internal structures, such that operational burdens are sustainable. The determinative innovation of networks is that they transform external contradictions into a tense, but sustainable, ‘double-orientation’ within the operational system. One and the same operation is exposed, both to individual network node orientations and to the collective orientation of the network” (Teubner 2004:13).

The question is then: “How is law to respond to this transformation of external contradictions into an internal - simultaneously individual and collective - orientation?” (ibid.:14).

## **THE EMERGENCE OF “HYBRID LAW”**

If intentionality and hence responsibility is distributed in hybrid network arrangements such as ‘human-machine combat teams’ or ‘intelligent partnerships’, the central question is: How is law to respond to questions of liability in the event of misconduct or malfunction? In hybrid networks, the distinctions between state, individual and corporate responsibility are increasingly blurred and challenge the binary logic of legal semantics:

“Hybrid networks are remarkably disruptive social phenomena... Legally-speaking, they can take the form of corporate, contractual or tortuous special relationships. For this reason alone, legal doctrine cannot simply adopt the term ‘network’ as a legal concept... Instead it must itself reconstruct anew the constitutive contours of the correlating legal definition out of its own path-dependent evolutionary logic” (ibid.:9-10).

This challenge is well illustrated in the ongoing debate on the legality of drone warfare, which has invoked the different legal regimes of International Human Rights Law, the Laws of Armed Conflict and the principle of state responsibility (Crootof 2015:98). In fact, there seems to be a general state of “legal irritation” created by hybrid arrangements in all sectors of society. Inger Johanne Sand, following Teubner, has characterized this tendency as the ‘hybridization of law’:

“Instead of the binary distinction legal/non-legal there are oscillations between different legalities... What is legal will then often be a close oscillation between contradictory legal norms and different values and the function of predictability is challenged or changing” (Sand 2012:190).

According to Teubner, a new legal construct of ‘network share liability’ emerges in hybrid law, distinguishable from both individual (contractual/market) liability and the collective (corporate/hierarchical) liability of organizations and states. This construct is especially suited to situations where the individual contribution of networked operators to damage can no longer be clearly distinguished:

“The appropriate form of liability is a decentralized, multiple and collective combination of network liability and the liability of nodes who have in fact participated within the operation under scrutiny. In contrast to comprehensive collective liability in the case of formal organizations, this leads to a re-individualization of collective liability within networks... One might make use of the notion ‘network share liability’; a form of liability that is particularly significant in situations where the root cause of damage cannot be traced back to individual nodes, but only to the network itself” (Teubner 2004:21).

The difficulty of combining collective and individual liability is exactly what causes ‘legal irritation’ in the controversy of AWS. The solution of ‘network share liability’ is to allow a *double attribution* of responsibility to individual actors and the network as a whole. The legal form of double attribution is one of the most important characteristics of hybrid law, facilitating the simultaneous attribution of responsibility individual and collective actors. One and the same transaction is doubly attributed; to individual actors as network nodes and to the overall network (ibid.:20). Thus, the emergence of hybrid law involves the practice of a more reflexive and context sensitive form of *jurisprudence* that allows the simultaneous application of different and often opposing legal principles and justifications:

“Hybrid arrangements provide for an institutional environment where paradoxical communication is not repressed, not only tolerated, but invited, institutionally facilitated and, sometimes, turned productive. Hybrids as a highly ambiguous combination of networks with contracts

and organizations seem to be the result of a subtle interplay between different and mutually contradicting logics of action” (ibid.:13).

As a new legal form of risk management, the practice of hybrid law can be seen as a response to the conflicting demands of a complex risk environment where: “Obligations and prescriptions from multiple legal regimes interact to form a complex and evolving web of international governance” (Crootof 2015:98). In a technopolitical perspective then, the jurisprudence of hybrid law requires the critical capacity of officeholders and warfighters to coordinate and translate between a plurality of competing regimes of justification. In contemporary accelerated, multi-dimensional battlefields, this translation takes place in the interface of humans and autonomous technologies shaping critical decisions in the full spectrum of operations.

## **CONCLUSION**

Adopting a technopolitical perspective on the discourse of AWS allows us to map the coexisting, but mutually opposing rationalities and arguments of governments, organizations and experts without reducing the controversy to a single regime of truth. Instead, the way is paved for a constructivist and pluralistic view of risk management in cooperative hybrid networks. To promote a prudent and transparent debate and policy on the use of AWS, a comprehensive approach to the professional practice of risk management in hybrid networks should be developed. Formal organizational structures and procedures, legal principles and policies are mandatory, but they must be coupled with an understanding of highly specialized and contextual practices of hybrid network battle management, i.e. the ability to evaluate, coordinate and translate between a plurality of different and mutually contradicting rationalities across multiple domains of operation. In cooperative hybrid networks, decision-making and hence risk management should be viewed as a joint effort of human beings and technological artefacts. It is, in other words, an inherently hybrid affair, involving both human and machine cognition and intentionality. Understanding how best to incorporate increasingly intelligent and autonomous systems into military forces then requires cross-disciplinary collaboration between not only military operators, designers and robot engineers, but also anthropologists, ethicists, economists, lawyers and policy makers.

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