Human Visions of Future Non-Human War?

How advances in digital and robotic military systems are creating a new future non-human notion of perpetual conflict

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This article discusses the rise and increasing use of unmanned military systems. It describes how over the course of the last fifteen years they have increasingly become weapons of importance in modern-day conflicts. These new weapons have altered the nature of conflict, its shape, focus, and its political notion. Yet the largest risk comes not from the current changes, but from those in the near future. These foreseen changes could give rise to a scenario in which the notion and conduct of conflict could be further transformed, leading to an entire new concept of conflict. This is going to be an unmanned, non-human notion of conflict, in which the political cost of conflict will be radically different. This new notion, and its limited political costs, could subsequently create a perpetual state of conflict.

Over the course of the last two decades the world has rapidly become acquainted with digital and robotic systems.[1] When these systems first became visible to the larger public, they were often viewed as novel, sci-fi systems: Systems from the future, looking as if they came straight from a Star Wars film. Now two decades later Star Wars films are still full of innovations, Harrison Ford is still around, most recently starring in its VII episode, but the initial novelty and amazement that surrounded the introduction of digital and robotic systems has somewhat disappeared. Indeed, a quick look at the current state of technology illustrates just how

[1] Peter W. Singer, "The Proliferation of Drones. Changes in size, intelligence reframe questions of use" (Report, Washington: Heinrich Böll Stiftung, September 2013).

fast these futuristic digital and robotic systems have become part of everyday life. Unmanned aerial vehicles, more popularly known as drones, are the most visible element of this technological revolution, and the cornerstone of a contemporary revolution in military affairs (RMA). They have become a common sight in recent years, with scores of hobbyists flying them to make beautiful images and videos with attached GoPros, occasionally causing a delay in flight services when a drone flies too close to commercially manned aviation. They have become so established (and desired) that they now top the annual Christmas wish lists of kids (and adults).[2]

At the same time robotic unmanned cars, as currently being developed by all major car companies, such as BMW and Nissan, and likewise under development by, or in cooperation with technology giants such as Google and Apple, seem to be on the brink of arriving at our roads, waiting to drive us home and to work, all without any direct human involvement, leaving the human with not more than the role of passive driver at best, hopefully leaving the era of drunk driving soon behind.[3] At the same time a wide array of digital technologies has been eagerly embraced and accepted by society in the recent decades. We cannot imagine our lives anymore without our smartphones, tablets, laptops, and smartwatches that do so much more than simply showing the time and giving an hourly bleep. Recent innovations in digital technology even seem on the brink of crossing the boundaries between our body and the physical: a new generation of chips, with built in internet connection capabilities, are now present on the market that can be directly inserted into the human body. These digital developments and subsequent digital love affairs by large majorities of our societies have been topics of avid discussion, among academics, politicians, technologists, and even at family birthday parties – albeit probably to a lesser extent. Likewise, plenty has been written on how our generation(s) have become addicted to digital technology and indeed to the generations born in the 1990s and

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[2] Alex Renton, "Christmas Gift: Attack of the drones," *The Guardian*, 23 November 2014.

[3] Todd A. Litman, "Autonomous Vehicle Implementation Predictions Implications for Transport Planning" (Report, Victoria Transport Policy Institute, 2015).

later, digital (and robotic) technology seems as much a common good as bread and rice.[4]

As such it seems that increasingly non-human systems are taking up a larger and more visible role in human societies and that humanity seems to have become accustomed to and comfortable with these technologies. We are still far from Stanisław Ulam's concept of singularity, and Ray Kurzweil's and Vernor Vinge's predictions about reaching this stage, in 2030 and 2045 respectively, for the moment still seem more fantasy – or horror for the matter – than fact, but we can without doubt state that our societies have become highly digitalized, and that machines – digital and robotic – have taken up larger roles in our world.[5] In order for modern day societies to function well, it is by now largely dependent on not only well functioning humans – that is order, security, and health – but likewise the well-functioning of digital and robotic systems.

Despite this growing dependence and wholehearted embracement of these technologies, societies are only now gradually starting to comprehend the broader implications of these digital and robotic revolutions, and how it will impact the future development of our societies.[6] The debate for example about the coming age of robotisation on the work floor, and the subsequent demise, and possibly even disappearance of the blue-collar worker, for example has only recently emerged. Despite this, the robotic takeover of the work floor has been an ongoing process for well over a decade, and the concept of blue collar workers, one next to each other on the assembly line, is still increasingly common in low income countries, where the costs are low enough to still sustain human assembly lines. Assembly lines, in nations where the hourly wage of a blue worker have been substantially higher, such as in Germany, have been a

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4 Manuel Castells, "The Impact of the Internet on Society: A global perspective," *MIT Technology Review* (September 2014).

5 Ray Kurzweil, *The Singularity is Near* (New York: Penguin Group, 2005); Stanislaw Ulam, "Tribute to John von Neumann," *Bulletin of the American Mathematical Society* 64:3 (1958); Vernor Vinge, "The Coming Technological Singularity: How to Survive in the Post-Human Era" (Vision-21 Symposium, March 1993).

6 Castells, "The Impact of the Internet on Society"; "Digital Media and Society Implications in a Hyperconnected Era" (Report, World Economic Forum, January 2016).

mixture of workers and robots, working hand-in (robotic) hand already for some time.

Likewise, a similar tendency seems to develop regarding the introduction of robotic systems into social settings: in Japan, for example, the introduction of Pepper – a robot capable of sophisticated emotional (vocal) interaction and able to read a human's emotional state – has been largely one of wonder and amazement, without much of a debate emerging about what happens when robotic machines start to substitute human friends. The introduction of driverless cars seems to suffer from a similar fate: the ethical considerations about what a car, and their robotic drivers, should do in case it would see a deadly crash incoming, has been largely conducted on the sidelines, and has only barely influenced the rapid introduction of such cars. A few years ago, driverless cars were science fiction for the larger public, possibly a year ago a novelty, whereas by now they are already commercially operating in various United States' cities, seemingly accepted into civil life. Yet few ethical and moral discussions ensued on how exactly such cars should act when a collision is imminent. Should the driverless car decide to hit the other car, hoping for the best survival chances of its passengers, or should it sacrifice itself, as his car has only one passenger, whereas the opposing car is "driven" by the next-door-soccer-mum, with three kids on board?

In general, there seems to be a broader tendency that the technological speed of development, and the introduction of new systems into society, outpaces any possible debate about the utility and ethical and juridical implications that could change or newly develop as a result of the introduction of such systems. This has also been the case with digital innovations: Concepts such as the Internet of Things (Iot) and web 2.0,[7] have been largely embraced, without society willing to understand

[7] The Oxford Dictionary defines the Internet of Things as "The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data." With everyday objects here in the broadest sense. From your fridge, to your TV, your car, possibly your pacemaker, your watch to your hairbrush. All connected via the Internet into a giant (personal) network. Web 2.0 is not a new technology, but is rather simply a new way in which the Internet, and its webpages react with its users: from a static webpage (Internet 1.0) to more dynamic, interactive webpages. Famous examples are Facebook and YouTube.

the implications. Society at times does wonder about the possibility of what could occur if this mass of (big) data would be breached, hacked, altered, or misused, but the idea (and pleasure) of having your refrigerator always full with fresh food, the light on when one returns home, and the house comfortably warm – as enabled by IoT technology – seems to prevail within our societies. In this, mankind has ironically progressed little since mankind left its caves: The comfort of having (enough) food, light, and heat are still considered, to some degree at least, more important than critical thought. While these priorities might have altered only a little throughout the centuries, the world in which we live in has changed dramatically in the last decades. Human and non-human interaction was something found in sci-fi books during the last century, by now one can buy a robotic companion and friend for life. This whole technological development, at such rash speeds, seems to leave civilian societies in the middle of Terra incognita, wondering how a future of human and non-human interaction will look like, and which direction and road, we as societies, will take in this unknown world.

This unfamiliar terrain of (future) human and non-human interaction, and their respective roles is also the case in the military world, where the introduction and advancement of digital and robotic technology occurred earlier and has progressed further than in the civil world.[8] Much like in the civil world here too significant changes took place. Indeed, a look at recent conflicts illustrate how over the course of the last fifteen years, digital and robotic systems have taken up a role of importance in military conflict and affairs. The so-called drone wars – the US airstrike campaign, with Unmanned Combat Aerial Vehicles (UCAVs) against terrorists, led by the Central Intelligence Agency (CIA) – are probably the best known and most visible example of this.[9] This campaign started well over a decade ago in 2002, has invoked much discussion, and has become the most prominent weapon of choice for American presi-

[8] Singer, "The Proliferation of Drones," – P. W. Singer and Allan Friedman, *Cybersecurity and Cyberwar: What everyone needs to know* (Oxford: Oxford University Press, 2014), 2–4.

[9] Steve Coll, "The Unblinking Stare," *The New Yorker Magazine*, 24 November 2015; C. Christine Fair, "Drone Wars," *Foreign Policy*, 28 May 2010; Pir Zubair Shah, "My Drone War," *Foreign Policy*, 27 February 2012.

dents in their counter terrorism efforts. And it seems it will remain so in the near future: Donald Trump, the new president (and by the way also Hillary Clinton, his opponent in the elections), has firmly declared his support for drone strikes, something which is reflected in the high number of strikes his administration authorized in the first forty five days of his presidency, which at its current pace is a ratio of three times more intensive than under President Barack Obama.[10] Further indications of the growing importance of robotic systems is that the club of drone striking nations, which for a long time solely consisted of the US, the UK, and Israel, has seen a recent enlargement with a number of nations, with much more limited military capabilities and budgets, joining the group: Pakistan – in the Federally Administered Tribal Areas (FATA), Iraq – against ISIS targets in Northern Iraq, Nigeria – against Boko Haram terrorists, and Myanmar – against insurgents in the border area with China, have in the last two years all conducted drone strikes.[11] In addition, non-state armed groups, such as Hezbollah, ISIS and other actors in the Syrian civil wars are widely using robotic systems, for intelligence, surveillance, reconnaissance, and even limited bombing purposes.[12] In this, the long held western dominance on robotic military technologies seems to be slowly disappearing, with now military robotic systems available to an ever increasing numbers of actors, for a wide range of purposes and possibilities, contributing to a changing face of conflict.[13]

Yet while these technologies, and drone wars, are now becoming a global military affair and are changing the nature of conflict, militaries, politicians, and governments do not (yet) understand the full implica-

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[10] Micah Zenko, "The not so peaceful transition of power: Trump's drone strike outpace Obama," *Council on Foreign Relations*, 2 March 2017.

[11] Tobias J. Burgers, "An Unmanned South-China-Sea? Understanding the risks and implications of the arrival of the digital and robotic revolution in military affairs in the South-China-Sea," – *Power Politics in Asia's Contested Waters: Territorial Disputes in the South China Sea*, ed. E. Fels and Truong-Minh Vu (Cham: Springer, 2016), 77–94; Scott N. Romaniuk and Tobias J. Burgers, "China Could Dominate the Global Armed Drone Market," *China Policy Institute Analysis*, University of Nottingham (20 February 2017).

[12] Scott N. Romaniuk and Tobias J. Burgers, "Entering the Era of Unmanned Terrorism," *Jamestown Terrorism Monitor* 15:1 (2017): 5–7.

[13] World of Drones, New America Foundation website.

tions these technologies will have upon the future notion of conflict. Indeed, much of the introduction of military robotic systems has been a process in which not much thought has been given about future political implications and which can be better summarized under the motto "we will see where it goes".[14]

As one US colonel adequately pointed out, "we are building the bridge to the future while standing on it".[15] Such limited considerations about our future, and the future of conflict, and how it will be influenced by the rise of robotics, raises numerous questions that should be answered. At the centre of this discussion should be the question of what a future vision of conflict will be like? It is without doubt a good thing that the military is building a bridge to future: It at least provides a basis on which a future can be built, nevertheless the direction of this bridge and what happens once militaries exit the bridge is poorly understood. In this regard, we could nearly go as far as to state that the military establishment, and the political establishment for that matter too, seems to be partially blind to the (political) implications of technological revolutions of its own making. Ironically so, as robotic systems are often hailed within military establishments as increasing situational awareness, thereby decreasing the infamous Clausewitzian 'fog of war', a new fog of war seems to be rising. That fog could muddle the categories of conflict and of war altogether, with unforeseen and possibly tragic consequences.

A future notion of war, in which humans have an increasingly limited role, raises fundamental questions about the future political nature of war. Throughout the history of warfare, the human factor and cost have been important, if not decisive factors, in questions on the political necessity, utility and benefit of starting, continuing, and ending wars. However, future unmanned, nonhuman wars would only to a limited degree face questions about their political, social and economic cost from the larger public, exactly due the direct absence and role of humans in waging war. This raises the question what will happen with the notion and conduct of

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[14] David Kilcullen and Andrew M. Exum, "Death From Above, Outrage Down Below," *New York Times*, 17 May 2009.

[15] Quoted in Peter W. Singer, *Wired for War* (New York: Penguin Press, 2009), 16.

war, if it becomes such a "low cost" affair? Could we in the future possibly conduct wars on the "political cheap"? And if wars become so easy to conduct – due to their limited economic, political and social costs – will the world find it easier to start more wars, to continue them, and possibly to never end them? Could we be moving into a continuous state of war? Wars far away from the public's interest, experience, and vision?

Theoretically speaking, such a state of affairs and endless wars could lead to a reversion of Kant's peace theory, which has been the basis of peace and conflict studies, and has influenced generations of policy makers, politicians, military leaders, and citizens. Should we imagine a future, in which the world is embroiled in a perpetual state of war, made possibly by digital and robotic machines? In which universities will solely have departments and research institutes for conflict and war studies, rather than peace and conflict resolution, as peace, and the concept of it could have by then become something of the past, gathering academic dust. An ancient, romantic concept, cherished by historians, but not of importance to those who will study contemporary political and military affairs.

This paper seeks to understand these future visions, answer the questions posed above, and aims to predict to which extent future visions of war will be digital and robotic, and what this will mean for the political notion of conflict and war. It seeks to analyse this by answering two main questions. First, how likely is the above described scenario of digital and robotic conflict? Secondly, what would be the political implications of such a state of conflict?

Current visions of war: the emerging non-human in war

As the famed physicist and Nobel laureate Niels Bohr said "Prediction is very difficult, especially if it's about the future". Now, Bohr was without doubt right, and predicting and understanding the future is a difficult, and in the case of military affairs, indeed often a thankless task. Furthermore, questions like how far can you look, and how accurate will it be,

are always of importance. History is littered with beautiful cases of futurists who predicted the most fantastic, or horrendous futures, only to be proven wrong by time. As Conrad Crane, the former director of the U.S. Army Military History Institute, rightfully noted that when it comes to understanding future visons of conflict and predicting how war might develop in the years beyond the horizon the effective range is up to 20 years. Any predictions after this timeframe would be difficult and would run the risk that future visions might be filled with mistakes, or even horribly off.[16] Crane quotes from T. X. Hammes, a Distinguished Research Fellow at the U.S. National Defense University, who makes the point quite beautifully: "There is a fine line between a vision and a hallucination."[17] Fortunately, predicting and understanding a future vision of robotic conflict does not need to be as difficult as Bohr made it sound – and hopefully not as thankless – and with a bit of luck hallucinations should not occur. This is foremost the result because when it comes to predicting a robotic, partly non-human future of conflict, the first contours of such future robotic conflict are already visible. The prior mentioned US drone strike campaign is the prime example of how the future is already here, but the use of robotics in conflict has a long history.

It is history which gives us the first indications of how future robotic conflict just might look. In this, the famed strategist and philosopher Machiavelli was right when he said that "Whoever wishes to foresee the future must consult the past."[18] The roots of the digital and robotic revolution in military affairs (DRRMA) can be traced back to the late 1970s. It was Marshal Nikolai Ogarkov, Chief of the General Staff of the USSR, who was seeking new ways to close the ever increasing capabilities gap between Warsaw pact forces and NATO. He sought to initiate a military-technical revolution that would allow the USSR to (re)gain the upper

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16 Conrad Crane, "Note to Futurists: The maximum effective range of a prediction is 20 years," Warontherocks (website, 3 October 2016).

17 Ibid.

18 Niccolo Machiavelli, *The Historical, Political, and Diplomatic Writings of Niccolo Machiavelli* (Boston: Osgood, 1882). The original quote can be found in the first sentence of chapter XLIII (43), "Natives of the Same Country Preserve for all Time the same Characteristics," found in the Third Book of his 1513 work *Discourses on the First Ten Books of Titus Livius*.

hand in a possible military conflict with NATO.[19] The United States, afraid of losing its technological advantage over Russia, sought to counter this technological revolution and started its own revolution in military affairs, which ironically caused the capabilities gap to grow even larger. In the following years, this RMA, which is often called the second offset strategy, enabled the emergence of an array of new military concepts and doctrines, such as network centric warfare, and information warfare. At the same time, it created or contributed to technological innovations such as stealth technology, the global satellite positing system (GPS), and most famously ARPANET, which we now know better as the internet.[20]

This second offset strategy also created the initial framework for the research and development into digital and robotic military technologies, which eventually developed into the DRRMA.[21] Much of the initial rise of robotics remained hidden to the larger public, and it was not until the first Gulf War that we saw the first glimpses of how exactly a future of robotic conflict would look: It was during this conflict that we saw the operational introduction of the most visible part and well known element of the DRRMA, namely the Unmanned Aerial Vehicle (UAV).[22] Encour-

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[19] Götz Neuneck and Christian Alwardt, "The Revolution in Military Affairs, its Driving Forces, Elements and Complexity," IFSH Working paper no. 13 (May 2008).

[20] Steven Metz and James Kievit, *Strategy and the Revolution in Military Affairs: From theory to policy* (Strategic Studies Institute, US Army War College, 1995); Singer, *Wired for War*; Andrew Turner, "The Impact of RMA on Peacekeeping" (Paper presented at the Third Annual Graduate Student Symposium of the Conference of Defense Associations Institute, 3–4 November 2000). The first offset strategy centered around atomic weapons. For further information on the 1st, 2nd and current offset strategies see: http://warontherocks.com/beyond-offset/ (accessed 1 April 2016).

[21] Metz and Kievit, *Strategy and the Revolution in Military Affairs*. Initially the two elements of the DRRMA developed separately, but in recent decades the crossover and interdependence between both RMAs have been significant, with both enforcing each other. As the digital sophistication of robotic systems further increases and with robotics moving into digital conflict we can expect that the interrelation between both RMAs will further grow. See for further information on the interaction between both technologies, Robert O. Work and Shawn Brimley, "20YY Preparing for War in the Robotic Age" (Report, Center for New American Security, January 2014), 23.

[22] These UAVs even managed to capture (limited) headlines when for the first time in conflict history soldiers surrendered to an unmanned system: On two occasions, Iraqi soldiers surrendered to RQ-2 Pioneers UAV flying above them. See for further details: "Iraqi soldiers surrender to AAI's drones," *The Baltimore Sun*, 2 March 1991.

aged by its initial success, the United States armed forces conducted further research and development into a new generation of robotic systems. This resulted in the development of the now iconic MQ-1 Predator, which was actively used in the Balkan conflicts.[23] Despite its initial success, the DRRMA progressed relatively slowly, and it was not until the outbreak of what later became known as the Global War on Terror (GWOT) that the development of DRRMA fully took off, and further signs and visions of an emerging robotic notion of conflict arose. It was during the initial two years of the GWOT that the world was introduced to armed UAVs (UCAVs) – or killer drones as they more popularly became known – and a further wide variety of unmanned systems, operating on land, sailing the seas, operating in space, and foremost flying in the air. During this decade, the development, procurement and use of unmanned systems became widespread: The United States armed forces alone increased their UAV and UCAV capacity forty-fold. European, South-Korean, and Japanese armed forces acquired their first unmanned systems, and China and Russia developed their own unmanned systems. A study by the New America Foundation found that in 2015 seventy-eight nations and non-state actors had unmanned capabilities, and that twenty two actors possessed armed unmanned capabilities.[24]

As such, the first notion of future robotic conflict has already started, and that in this regard the future is now, or even already behind us. As the numbers illustrate – military robotics, and the DRRMA – became a global military affair, with increasingly military nations seeking to shift the burden of conducting military conflict to non-human robotic systems, rather than solely humans. Nevertheless, it should be noted that conflicts in which robotic systems are actively involved remain to date limited. As noted earlier, the group of drone-striking-nations has increased rapidly in recent years, but still remains limited, particularly when compared with other conflicts around the globe, in which conventional weapon systems and human soldiers are without any doubt still the most important force.

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[23] Houston R. Cantwell, *RADM Thomas J. Cassidy's MQ-1 Predator: The USAF's first UAV success story* (BiblioScholar, 2012).

[24] New American Foundation (2015), World of Drones website, available at http://drones.newamerica.org/ (15 March 2016).

In this respect, the era of the famed or feared, infamous – depending on whom you ask – Kalashnikov is certainly not over. To date much of the military robotic integration remains primarily an affair of conventional military actors. As the number of conventional conflicts, in which such systems could and would be used, is declining, the era and the notion of all-out robotic warfare being the standard notion and conduct of war remains farfetched and, to quote T.X. Hammers once more, would be "a hallucination".

Toward an increasing non-human and robotic notion of conflict?

Even though robotic conflict will not be the most dominant modus of warfare in the coming decades, it is without doubt that the frequency of robotic warfare will only increase further. Therefore, the question of whether such conflicts could take place, and what they would look like, seems just and necessary. As noted above, (recent) history might be able to show some initial insights into future robotic conflict. The CIA drone wars, and the subsequent drone strikes by other nations illustrate a conduct of war in which the soldier is not actively in the combat zone, but remains nevertheless heavily engaged in the conflict itself. Thus being to the extent that UAV operators suffer from higher psychological burdens of conflicts, such as PTSD, than their colleagues actually physically present in (human) combat zones.[25] In addition, current military robotic systems generally require a high degree of supervision and support. An estimated 120 personnel are needed to operate a single US MC-9 Reaper UAV and its operations. As such, despite all the talk about unmanned wars, current robotic conflict with unmanned systems remains still very much, and quite paradoxically, a human intensive, and even costly, affair.

[25] Wayne Chappelle et al., "An Analysis of Post-Traumatic Stress Symptoms in United States Air Force Drone Operators," *Journal of Anxiety Disorders* 28:5 (2013): 480–487; Alex Edney-Browne, "Embodiment and Affect in a Digital Age: Understanding mental illness in military drone operations," *Krisis* 1 (2017): 19–33.

The question however arises to which extent this initial notion of robotic conflict is likely to resemble the future of robotic conflict? In this regard, the initial notion of robotic conflict was and is one of a rather "simple" robotic conflict. Indeed, much of what we currently have seen of robotic warfare has taken place in asymmetrical scenarios, in which those at the receiving end of robotic strikes have had limited, or no means, to defend themselves against unmanned systems, meaning that nations using unmanned systems could and can use relatively unsophisticated systems, who have only limited (robotic) capabilities. A brief look at the systems currently in use – from the American Predators and Reapers to the Chinese Ch-4s – illustrate that the large majority of unmanned systems in use have by no means the capability to survive in a hostile environment, and as such do not pose a threat to actors with significant military capabilities. For example, the American Predator UAV that tried to take on an Iraqi MiG-25 – an aircraft which has been around for over 40 years. In the words of David Axe it "sucked at it": It failed to hit the opposing aircraft and was quickly turned into a heap of burning metal and plastic, spiralling towards the desert.[26]

We should view the recent history of robotic conflict as a starting point in the larger technological revolution of the DRRMA. Much like the T-Ford, it was a technological highlight during its times, yet at the same time it was the start of a long development cycle, spanning over a century already, with significant changes along the way. This is bound to happen as well with the development of military robotic systems, and as such we can likewise expect major changes to the configuration and capabilities of unmanned systems. In order to understand in which direction the DRRMA will evolve, and what those major changes would be, we should first understand how military actors perceive the "general" future of military affairs. In this regard, and despite the GWOT and all other affiliated abbreviated anti-terrorism wars, the common understanding is still that nation states, who have military capabilities well beyond any insurgent and terrorist army, see other nation states as the primary military and

[26] David Axe, "Predator drones once shot back at jets… but sucked at it," blog post at *Wired* (11 September 2012).

security threat. Indeed, in East-Europe, Al-Qaeda, or ISIS, or any other terrorist organization is not seen as the primary threat, rather it is one that has been for long perceived as the foremost threat: Russia.[27]

In China, the Communist Party and the People's Liberation Army do not view Islamic terrorism as their primary threat, it is the United States, its Asian Pivot and its regional allies (e.g. Japan and India) that are on top of their threat list. At the same time, the other regional actors in South-East and East-Asia view China as their primary threat, even if in some active terrorist insurgencies do take place.[28] Even the initiator of the GWOT, and the nation spending most military resources in the fight against global Islamic terrorism, the United States, does not view global terrorism as the most existential and primary threat. In a statement last year, the now chairman of the joint chiefs of staff, Marine Corps General Joseph Dunford, stated he sees Russia as the primary threat, followed by China and North-Korea respectively, with ISIS only in fourth place.[29] Despite all the recent focus on "new wars", hybrid wars or any other euphuism, classical conventional, symmetrical threats and conflicts are still dominating future threat and conflict scenarios. It therefore comes as no surprise that the directional development of robotic military systems has over the course of the last years steered towards systems that are aimed at such future threat scenarios.

The design of the current generation of unmanned systems under development seems to depart from the initial "simplicity" and puts an increasingly large emphasis on automation and autonomous capabilities, which should allow for survivability in the highest spectrum of military violence. Examples such as the X47B, an UAV capable of starting and landing on an aircraft carrier, the RQ-170, 180 UAVs, and the Chinese "Divine Eagle" are prime examples of next-generation automated and autonomous unmanned, stealth systems, which are capable of conducting the majority of their tasks without any human interference or guidance,

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[27] Margriet Drent et al., *New Threats, New EU and NATO Responses* (The Hague: Clingendael Institute, 2015).

[28] Burgers, "An Unmanned South-China-Sea?" – *The China Threat: Perceptions, myths and reality*, ed. Ian Storey and Herbert Yee (London: RoutledgeCurzon, 2002).

[29] For a summary and a report of Dunford's statement see *The Wall Street Journal*, 9 July 2015.

An X-47B Unmanned Combat Air System demonstrator flies near the aircraft carrier USS George H.W. Bush. Official U.S. Navy photo by Erik Hildebrandt

and which should be capable of operating in the highest violence spectrum. This drive for automation and autonomous capabilities, and survivability is likewise witnessed in the development of the new generations of UGVs and UUVs. The US Navy self-guided unmanned patrol boats are a prime example. These boats are entirely operating autonomously, including the capability to communicate with each other and operate in swarm tactics.[30]

Likewise, in the field of Unmanned Undersea Vehicle (UUV) development the direction is heading towards more robotic capabilities, and lesser human involvement. The U.S. Navy, in their Unmanned Undersea Vehicle Master Plan, indicate too that it seeks to build systems that can operate for long periods of time, with very limited human involvement.[31] The anti-submarine warfare continuous trail unmanned vessel,

[30] Dan Gettinger, "What You Need to Know About Drone Swarms" (Blog post, Center for the Study of the Drone at Bard College, November 2014).

[31] James Holmes, "The U.S. Navy's Next Super Weapon? Here Come Unmanned Underwater Vehicles," *National Interest* (January 2015); United States Navy, *The Navy Unmanned Undersea Vehicle (UUV) Master Plan* (published online, 2004).

or ACTUV, is the prime example of this vision of next generation UUVs, capable of operating independently for months at a time, covering thousands of sea miles.[32] The desire for more robotics and less humans is not solely an American one: Samsung developed an almost entirely autonomous stationary robot, the SGR-A1, which is able to autonomously identify and destroy targets.[33] Likewise, in Europe (e.g. Taranis and the nEUROn) and China (Dark Sword and Sharp Sword) further unmanned systems are under development which focus on medium to high combat zones, and which are largely autonomous and automated.[34] In this, the current generation of unmanned systems under development seems to be pushing the boundaries of human involvement and control in unmanned systems: The role of a human operator will become increasingly limited and will primarily focus on target selection and the decision to engage a target, leaving all other roles and tasks to robotic systems itself. This human decision to engage a target would then become the sole boundary left before we can truly speak of robotic conflict. Indeed, in the discussion on future robotic conflict, and if this will occur, the human-in-the-loop argument has been used as the main argument that full robotic conflict will not take place (in the near future).

This discussion, however, when the full boundary of robotic conflict is reached is somewhat flawed. The main argument in this discussion has been so far that there has always been, and will be a human in the loop. In the case of the current (CIA) drone strike campaign such has been indeed the case, as the threat environment is minimal, allowing the (human)

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[32] For more information, see Cheryl Pellerin, "Deputy Defense Secretary to Help DARPA Christen New Class of Sea Vessel," *U.S. Department of Defense* (online, April 2016).

[33] Alexander Velez-Green, "The South Korean Sentry – A "killer robot" to prevent war," *Lawfare* (blog post, 1 March 2015). The SGR-A1 in its current operational use is still controlled by humans. Samsung itself argues that there is still very much a human in the loop. However, the system has the capability to go fully autonomous, and even in its current configuration the only decision made by a human operator is the decision to engage a target. As such, rather than speaking of a human in the loop, it would be better to rename a human on the loop, given the limited interaction and involvement of humans in the entire process.

[34] David Axe, "China's First Stealthy Killer Drone Takes Flight," blog post at Warisboring (November 2013); Michael S. Chase et al., "Emerging Trends in China's Development of Unmanned Systems," *Rand National Defense Research Inst.* (Santa Monica, CA., January 2015). For more information about the systems, see the websites of Dassault Aviation and UK Defence Journal.

operator sufficient time – at times even weeks – to decide to strike at a target or not.[35] However, in a high paced, conventional military conflict such is not the case. Here the decision to engage would be one of minutes, if not seconds. Seconds in which a decision must be made, based on information provided by machines and digital technology. In such a scenario, it can be expected that the operator will follow up on the digital input and advice. As such we could argue that in such situations the human-in-the-loop concept is rather limited, or even non-existent. A perfect example of this is the Iron Dome system, used by the Israeli Defence Force to defend against rocket attacks from the Gaza strip. According to the IDF a human operator always has the final decision to engage or not, and it argues that as such there is indeed a human in the loop. However, this loop is limited to 3 seconds, making it debatable if a human is really in the loop. Therefore, the author believes that, even when a human is in the loop in the near future, we can actually speak of robotic conflict. And given the frenzy with which major military nations and arms manufactures are researching and developing next generation autonomous and automated, high-end systems, it seems increasingly likely that future conflicts will occur which will be truly robotic in nature. Thus, it is not a question if, but rather when, robotic conflict takes place. When this occurs, it would create an entire new paradigm in conflict: It would mark the first time in the entire history of mankind that conflict would be fought without any direct human involvement.

Political implications: an invisible peace or a perpetual state of war?

As this new paradigm of conflict arrives on the horizon, it raises questions about the political implications of this new notion of conflict. Throughout history, the conduct of violent and military conflict and wars have been limited due to its social, economic, political and human cost. Foremost

[35] Jason Wei, "The Case for Drone Warfare," *Dartmouth College Debates in International Politics* (November 2016).

the human factor has influenced whether conflicts would start, continue, and end: Societies have boundaries of just how much destruction and death they are willing to bear. Particularly in recent decades, in developed nations, the willingness of the larger public to engage in conflict, and foremost to sustain casualties, has been very limited. Indeed, numbers show that violent conflicts and related casualties over the course of the last decades have slowly decreased.[36] However, robotic systems have the potential to reverse this course, which could possibly lead to an increase in conflict again: The use of unmanned machines, the absence of human casualties, and the low visibility of such conflicts, could create a scenario in which political leaders would seek the appliance of violence once more to pursue political goals and to solve political conflicts, rather than first trying to solve a political conflict via diplomatic means. This would constitute a major change and reversion of the progress made over the course of the last decades. It would be a reversion of the Kantian goal of a perpetual state of peace. Rather, it could be replaced by a perpetual state of conflict: An invisible, ever continuing state of violence fought by robotic machines. We therefore should seek to better understand the implications of the rising use of robotic systems in military affairs before we enter a world in which the violent appliance of robotic systems becomes the norm to solve (political) conflicts, and in which perpetual peace remains an invisible dream. As the US colonel stated earlier on in the paper: "We are building a bridge to the future, while standing on it".[37] Well, it seems time we should start to consider better in which direction this bridge is going, and how future conflict will look once we cross over the bridge.

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[36] Human Security Centre. *Human Security Report 2005: War and peace in the 21st century* (Oxford University Press, 2005).

[37] Singer, *Wired for War*, 16.

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