

BBM and BlinkenArea
present

EPKOT

Experimental Prototype Killers of Tomorrow

April 23rd to 27th 2012
HANNOVER MESSE - Hall 6



EPKOT is an interactive scenario, staging the bitter truth about next generations autonomous robots, animal-like machines that help the military to remotely control borders and kill people around the globe – with taking no personal danger.

The six robots that perform an audioplay written by BBM (Observers of Operators of Machines) are embedded in an immersive site made of 150 sqm pixelwall by BlinkenArea. The content of the play has been generated with the help of the International Committee for Robot Arms Control (ICRAC), a UK based NGO that monitors the dangers that military robots pose to peace and international security and to civilians in war.

EPKOT is part of JETLAG, contemporary art from China and Germany, an exhibition organised by Harro Schmidt, FAUST Hannover and Peng Feng, curator of the Chinese Pavillion on Venice Biennale.

Preface

by Dr. Steve Wright

Applied Global Ethics, Leeds Metropolitan University, UK

EPKOT is a creative shaft of light into a new tomorrow most of us don't want to see. Recently, I found myself musing about the DARPA programme of research to make robots hunt in packs for "uncooperative humans" like dogs to the tune of who let the dogs out. and the notion of putting into these systems behaviour that most of us would find obnoxious in real life. And the idea that such software is malleable since other robots are already on the battlefield as "buddies" They can lift up a wounded soldier and carry them back to base. For me in your play EPKOT there are echoes of Zygmunt Bauman and his so called liquid modernity and the notion – in his book "Wasted Lives. Modernity and its Outcasts" – that a whole class of people now are designated as flawed consumers. The horror here is that as in the sci fi movie Soilent Green, it is as if we have evolved technologies to consume us since more money can be made from that process. BBM – keep on pushing! no one else has captured the coming swarm.

The Perfect Murderer

EPKOT, "Experimental Prototype Killers of Tomorrow", is a "theme park-" style scenario for six robots engaged in a conversation. The mechanical actors play the roles of hi-tech war-machines, which hunt down their booties like a swarm of hungry animals.

For the art project EPKOT the name of Walt Disney's Science Center "EPCOT" has been appropriated and reinterpreted by the artist group BBM (Beobachter der Bediener von Maschinen, i.e. Observers of Operators of Machines).

Who are BBM?

Over the last 23 years the artist group BBM has been carrying out pioneering work in the field of researching and displaying the societal impacts of state of the art technology and the use of unmanned systems in conflict (urban and military warfare) and border control. BBM has been publishing their research both on paper and as video and has been working closely with researchers around the world. Their European Commission funded three-year project TROIA (Temporary Residence of Intelligent Agents) on the "technologies of political control" – realized in joint efforts with BlinkenArea – has been investigating future security technology and its impact on civil rights. TROIA has been building up standards for a new kind of cultural production in public space and connecting west- and east European cultural institutions.

The fact that the members of BBM as artists and stakeholders in the cultural field serve as experts in a field where a background in hard science seems to be indispensable, opens both the minds of scientists and the societal perception of ongoing developments in the high-tech area.

BBM focusses on scientific and technological option assessment and therefore involves members with a background in law, psychology, media theory, as well as hardware- and software designers with explicit knowledge in how to get complex technical systems running.

To foster the critical perception of the threads for and shifts of democratic societies which intensely use and prolifer these technologies is the centerpiece of BBM's work.



What is EPKOT?

The acronym EPCOT originally reads “Experimental Prototype Community of Tomorrow”. This is the name of a utopian city of the future. In Walt Disney’s words: “It is a society of tomorrow that will never be finished, but always tries out new technologies and systems. EPCOT is a showcase for the world that exists for the ingenuity and imaginativeness of our economy.”

In a futuristic “negativland” – in the audioplay it is called “the Enchanted Killing Room in EPKOT” – the robots made by BBM operate without any human intervention. They react to the appearance of people. The vehicles seem to act “intelligently”. But what guides their behavior?

The robot’s conversation topics are limits and restrictions, but also unprecedented opportunities for action, beyond any ethical qualms. Here we envision the true face of the “revolution in military affairs”; as announced during the “war on terror”.

EPKOT offers visitors the chance to experience both physically and intellectually a future that is organized according to the rules of the military-industrial complex.

EPKOT is a critique of the “imaginativeness of our economy” (Walt Disney), a call to all visitors to engage actively for the humanitarian rules in a democratic society.

Convenient Killing

Today robots work in support of border control troops, they to help carry equipment, guarding prisoners, manoeuvre “safely” through mined or contaminated land while causing no human fatalities. In addition to their abilities to fly, climb, swim, draw, cut, drill and rescue, they can kill pretty accurate. Is the robot the perfect murderer of the 21st Century?

What’s the socio-psychological reason for our “propensity to kinetic action” – even accepting a high civilian death ratio? (read more at: <http://dronewarsuk.wordpress.com>) What exactly makes the “PlayStation mentality” that surrounds drone killings? (see “A Killer above the law”, The Guardian, August 2nd 2010) Why does it feel like “convenient killing” to use a drone instead of a pilot? (see report of same title by Chris Cole of The Fellowship of Reconciliation, 2010)

Why does it appear so comfortable to us to have the “dirty job” done by a machine? How much responsibility does the device inherit from the soldier? Which kind of society is created by apparatuses with software that allows “certain liberties”?

And last but not least: why does the Western World maintains silent on the US Targeted Killing Policy? “Vested Interest or Moral Indecisiveness?” as Nathalie Van Raemdonck in her March 2012 Istituto Affari Internazionali Working Paper puts it.

To answer these questions, BBM and BlinkenArea built a theme park of its own: a hi-tech environment with 150 sqm pixel wall that immersively embeds the robotic audio play.

For EPKOT, BBM cooperates with the UK-based non-governmental organisation ICRAC (International Committee for Robot Arms Control). With the help of internationally renowned experts ICRAC investigated how proliferation of killer machines change democratic societies. Among the participating scientists from ICRAC you’ll find Dr. Steve Wright, who holds a professorship at the University of Leeds for Applied Global Ethics. Wright has been working closely with BBM in the TROIA project on the “technologies of political control” between 2004 - 2006. Founder of ICRAC is Prof. Noel Sharkey, pioneer and critic of “artificial intelligence” and the co-inventor of the BBC format “Robot Wars”.

Still, there are no 100% autonomously operating military robots. Today, still always two people are requested: one human always operates the joystick and shoots by command of a higher ranking person. But with private military corporations taking over control in the global theatre of operation plus an intricate mix of intelligence and troops, most of our civilisation’s foundation that – for hundreds of years – has been taken for granted disappear step by step.

With this societal shift, the autonomous military machine leaves the science fiction and movies and finds its way into military “road maps” for the next 30 years. The scenarios for armed killer robots have been finalized. It takes only the political decision to let them go.

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Now, thanks to the “imaginativeness of the economy” and sponsored by military research and intelligence funds hundreds of war robot project come to life: IRobot with ex-MIT head of AI Lab Rodney Brooks as their mastermind (google for “Fast, Cheap And Out Of Control”) now have a joint venture with TASER to make stunning technology even more mobile and operational all around.

More than 2,000 deaths is the estimated number of fatalities from U.S. drone strikes only in Pakistan between 2004 and March 2012, says Noel Sharkey - followed up by 516 in Yemen, most of them in 2011 and 2012 - numbers increasing from month to month. And finally unknown numbers of casualties in Gaza by Israelian drone attacks.

BBM, April 2012

EPKOT - Experimental Prototype Killers of Tomorrow
Interactive Audio Play for 6 Robots

Text: Olaf Arndt/BBM, March 2012

Chapter 1 The Call

Heather: Hi! Honey, do you feel alright? Hi! HONEY!

Laura: Who is calling me up?

Alex: Careful, Laura:, it is up to you not to heed the call up if you dont wanna die!

Bruce: Funny, sweetheart, I have been listening to a call. Now I am bankrupt.

Ryan: Stupid nonsense. Robots like you do not run any businesses nor bank accounts. You are just a lot of scrap and wires.

Heather: Hi! Honey, do you feel alright? Hi! HONEY!

Victoria: Where are we?

(SOUND)

Laura: Listen honey, they are shooting at us!

Victoria: Duck and cover. They are shooting at us!

Ryan: Stupid nonsense, pure conspiracy. They are shooting... They! They! There is no they! This is just avantgarde music. No guns involved.

(SOUND)

Alex: This is going to be a rough ride.

Bruce: Ah, we are going to get through it alright, aren't we?

Alex: Don't count on it, pal.

Bruce: Do you suggest to duck and cover?

Alex: You'd better.

(SOUND)

Heather: Hi! Honey, do you feel alright? Hi! HONEY!

Victoria: Where are we?

(SOUND)

Chapter 2 The Enchanted Killing Room

Alex: Welcome! For your information: Your are in The Enchanted Killing Room at Epkot, where you can meet all your favorite Experimental Prototype Killers of Tomorrow.

Heather: Epkot is the smartest place to go if you are in love with the future.

Alex: We are...

Laura: ...Laura...

Heather: ...Heather and Vicky. The guys are Alex, Bruce, and...

Ryan: ...Ryan.

Alex: The six of us, we are your robo guides on today's tour.
(SOUND)

Ryan: Come on and join us. Meet all kinds of weirdo robo characters. They will make your living easier by erasing all of your enemies with in a glimpse. Find out how to kill remotely with taking no danger.

Victoria: Where are we?

Laura: Oh! Poor Vicky. Still. It must be very hard for you out here, cut off from the rest of the world.

Victoria: I do not know the rest of the world, Miss Laura.

Laura: Where are you from?

Victoria: I am not sure, but maybe: from here? From - how do you call it? - EPKOT?

Laura: Oh, what a surprise. It means, you were born in here?

Victoria: Yes, I believe I was made here.

Laura: What? Made?

Ryan: Laura, don't be naive! Vicky is not a person. She is a killer robot.

Laura: Oh, please forgive me.

all: Killing me softly with this bot.
Increasing my pain with his weapons.
Killing me softly with this bot.
Killing me softly with this bot.
Ending my whole life.
With his guns.
Killing me softly.
With this bot.

Laura: I wanna become a friend of a kill bot. It is a unique chance!

Heather: Get on the anti!social kill bot network. Twitter about murder. Twitter kill! kill! kill!

Ryan: Don't be funny, this is not politically incorrect. It is just an ad for Epkot and your most beloved Enchanted Killing Room.
(SOUND)

Chapter 3 Military Contractors

Bruce: What's up today? Today's program is cute learning with the robo wizards.

Laura: You know, military contractors are making robots faster, smarter and more lethal day by day.

Victoria: What else are they planning?

Bruce: Samsung offers Techwin SGR-1.

Ryan: The South Korean border guardbot is able to identify intruders and launch grenades in response.

Heather: Wow, I love Samsung. Can I become friend of Techwin SGR-1?

Laura: Samsung has 38 million 963 thousand 726 friends around the world today.

Ryan: Samsung communication connects people with friends who have been shot dead by other Samsung products.

Victoria: 738 million people like that.

all: 738 million people like that.

Alex: Cute learning with the robo wizards.

Victoria: What else are they planning?

Bruce: Boston Dynamics offers Big Dog.

Ryan: The robot pack animal capable of tracking humans over more than twelve miles of difficult terrain.

Heather: Wow, this is really smart. Can I become friend of Big Dog?

Laura: Big Dog has 12 thousand friends around the world today.

Ryan: Kill faster robo dog, kill! kill! kill!

Alex: Kill faster robo dog, kill kill kill!

Laura: Military contractors are making robots faster, smarter and more lethal.

Alex: We believe in science and industry.

Bruce: The industry will make it!

all: Eureka!

Heather: Thanks Epkot for introducing us into the world of the Experimental Prototype Killers of Tomorrow.

Ryan: Its a money making machine.

Victoria: Brave new Bots!

all: Kill faster, robot, kill kill kill!

Victoria: What else are they planning?

Bruce: The Israel Institute of Technology offers Virob.

Ryan: It is so amazingly tiny that it is able to creep within cavities with similar characteristics as the human body's veins.

Heather: Wow, this is really smart. Can I become friend of Virob?

Laura: Virob has 935 friends around the world today.

Alex: Welcome to The Enchanted Killing Room at Epkot.

Laura: You know, military contractors are making robots faster, smarter and more lethal day by day.

Victoria: What else are they planning?

Bruce: The Brigham Young University offers Wisar drone.

Ryan: It's a "wilderness search and rescue" drone, able to track humans and predict their most likely path.

Heather: Wow, I love the wilderness. Can I become friend of the Wisar drone?

Laura: Wisar has 6234 friends around the world today.

Ryan: Kill faster, Wisar drone, kill! kill! kill!

Alex: Kill faster, Wisar drone, kill kill kill!

Victoria: What else are they planning?

Bruce: École Polytechnique Fédérale de Lausanne offers Smavnet.

Ryan: It is a system in which dozens of swarming micro-air-vehicles may quickly improvise a robust communications network in any battle space.

Heather: Wow, I love to be part of a swarm. Can I become friend of the Smavnet vehicle?

Laura: Smavnet has 29 friends around the world today. I know, it is not a huge crowd, but we are out for more. We will hunt you down, friend by friend.

Heather: As my friend Laura always says, scientific research and the industry are making robots faster, smarter and more lethal.

Alex: We believe in science and industry.

Bruce: The industry will make it!

all: Eureka!

Heather: Thanks Epkot, the most funny science center in the world, for introducing us to the smartest Experimental Prototype Killers of Tomorrow.

Ryan: It's a money making machine.

Victoria: Brave new bots!

all: Kill faster, robot, kill kill kill.

Victoria: What else are they planning?

Bruce: The University of Ljubljana in joint venture with Epson offers Punching Robot.

Ryan: Its an assembly-line device capable of inflicting multiple blows of increasing intensity in order to analyze degrees of human pain.

Heather: Wow, I love Slovenia, the mountains and the red wine called Refosk. Can I become friend of Punching Robot?

Laura: Punching Robot has 1034 friends around the world today.

Ryan: Alex, hurt deeper, dear punching robot. Please hurt me so bad!

Alex: Hurt deeper, Punching Robot, hurt hurt hurt!

Victoria: And the US airforce: what are they planning?

Bruce: The U.S. Air Force currently works on Anubis, the super drone.

Ryan: Anubis is a sniper drone, capable of delivering a munitions payload to engage time sensitive fleeting targets in complex environments. Aerovironment, the company responsible for the Global Observer drone, received the contract for this project already.

Heather: Wow, sharp as a needle. I love the US Airforce, the goals they have and the kills they make. Can I become friend of Anubis?

Laura: Anubis has 203 million friends around the world today.

Ryan: Kill faster, Anubis, kill them all!

Alex: Kill faster, Anubis, kill them all.

(SOUND)

Chapter 4 The Blowback

Laura: The term "focused foiling" or "targeted prevention" is used by the Israel Defense Forces to describe the targeted killing of a person with "proven intentions" of performing a specific act of violence in the very near future. same if a person is linked indirectly with several acts of violence like organizing, planning, researching means of destruction. According to the the Israel Defense Forces the targeted killing raises the likelihood that his or her death would disrupt similar activities in the future. Unmanned aerial vehicles are used for such strikes.

Heather: What is the future of targeted killings?

Ryan: A blowback from civil liberties and human rights groups is likely to grow in direct proportion to any increase in targeted killings. Organizations such as Human Rights Watch have raised pointed questions regarding the perceived lack of accountability and transparency. The Washington Post questions if the United States is setting a negative precedent that will be invoked by other nations acquiring similar technology, such as China and Russia.

Heather: What is the future of targeted killings?

(SOUND)

Chapter 5 Targeted Killings

Ryan: Estimated Deaths from U.S. Drone Strikes in Pakistan from 2004 through March 2012.

2004 through 2007.
minimum 89 Deaths.
maximum 112 Deaths.

2008.
minimum 274 Deaths.
maximum 314 Deaths.

2009.
minimum 369 Deaths.
maximum 725 Deaths.

2010.
minimum 607 Deaths.
maximum 993 Deaths.

2011.
minimum 378 Deaths.
maximum 536 Deaths.

until March 2012.
minimum 61 Deaths.
maximum 84 Deaths.

Total Deaths:
 minimum 1,778.
 maximum 2,764.

Bruce: Funny Epkot. It teaches us, that this is a world destruction. Your life ain't nothing.

The human race is becoming a disgrace.
 Countries are fighting with robotic warfare.
 Not giving a damn about the people who live.

Alex: Still, we believe in the industry.

Laura: The industry will make it!

all: Eureka!

Heather: Thanks Epkot for introducing us into the world of warcraft and explaining about War.

What is it good for?
 Absolutely everything.
 Especially it is...

Ryan: ...a money making machine

all: War.

It's nothing but a heart breaker.
 Friend only to the undertaker.
 War is the enemy of all mankind.
 The thought of war blows my mind.
 Handed down from generation to generation.
 Say it again.
 War.
 What is it good for?

Chapter 6 The Roadmap

Alex: The Unmanned Systems Roadmap 2007 to 2032 includes the following Unmanned Aircraft Systems:

- 1.1. MQ-1 Predator
- 1.2. MQ-1C Sky Warrior
- 1.3. RQ-2 Pioneer
- 1.4. RQ-4 Global Hawk
- 1.5. RQ-4 Global Hawk Maritime Demonstration
- 1.6. RQ-5A Hunter
- 1.7. RQ-7 Shadow 200
- 1.8. MQ-8 Fire Scout
- 1.9. MQ-9 Reaper
- 1.10. Unmanned Combat Aircraft System – Carrier Demonstration
- 1.11. Broad Area Maritime Surveillance
- 1.12. Improved Gnat Extended Range. Warrior Alpha
- 1.13. Combat Medic UAS for Resupply and Evacuation
- 1.14. RQ-15 Neptune
- 1.15. Maverick
- 1.16. A160 Hummingbird
- 1.17. XPV-1 Tern
- 1.18. XPV-2 Mako
- 1.19. Onyx Autonomously Guided Parafoil System
- 1.20. Global Observer
- 1.21. RQ-14 Dragon Eye / Swift
- 1.22. Force Protection Aerial Surveillance System
- 1.23. Aqua and Terra Puma
- 1.24. RQ-11 Pathfinder Raven
- 1.25. Silver Fox
- 1.26. ScanEagle
- 1.27. Aerosonde
- 1.28. Buster
- 1.29. Small Tactical UAS and Tier II UAS
- 1.30. RQ-16A MAV
- 1.31. Wasp
- 1.32. Tactical Mini-Unmanned Aerial Vehicle

(SOUND)

Chapter 7 Robot Biology

Heather: The Unmanned Systems Roadmap 2007 to 2032 says:

Today, robot building depends almost as much on biologists and neuroscientists as it does on engineers and computer scientists. Robot builders seek insights from the animal kingdom in order to develop machines with the same coordinated control and locomotion and balance as insects and mammals. The purpose is not to create a robot that looks like a dog, but to build a robot for battlefield use, that can walk, creep, run, leap, wheel about, and roll over with the same fluidity as a canine.

Ryan: To do this requires not simply electrical wiring and computer logic, but also a deep understanding of insect and mammalian mobility, which in turn requires the inputs of zoologists, entomologists, and neuro physiologists. For now, bio inspired robots are mostly creatures of the laboratory. However, one would expect continued development and application of these robots throughout this decade and a backflow of insights to biologists, as they observe the development of bio inspired machines.

Alex: So, our most important question today is: do we have enough bio-scientists in our war robot teams?

Ryan: The Unmanned Systems Roadmap 2007-2032 says:

Transgenic biopolymers fall at the intersection of biological and materials sciences and offer the prospect of ultra-lightweight, ultra-strong, flexible, and low-observable skins for unmanned systems. As an example, the silk-producing gene of spiders has been spliced into the mammary gland gene of sheep, from whose subsequent milk the silk protein can be extracted. Breeding herds of such sheep enable spider silk, known for its light weight and high strength, to be produced on an industrial scale. The Army's Natick Laboratory is investigating this same protein for use as an anti-nerve agent drug.

Alex: Do we have enough bio-scientists in our war robot teams?

Heather: The Unmanned Systems Roadmap 2007-2032 says:

One form of nano particles, carbon nano tubes, could provide mechanical devices with very high resonant frequencies for use in unmanned system communication links. Surface coatings of combinations of nano particles

and electrically conducting polymers have been demonstrated that convert from transparent to opaque, change color, and heat or cool with an electrical command and offer an option for camouflaging unmanned vehicles.

Ryan: The thermo electric performance of bismuth nano particles offers the potential for developing high-efficiency, solid-state energy-conversion devices that could significantly reduce their size and weight in unmanned systems.

That's why we ask: Do we have enough nano-scientists in our military research teams?

Laura: The Unmanned Systems Roadmap 2007-2032 says:

Smart materials and their constructs combine the sensing, control, and actuation functions into one entity and allow synchronization with the changing environment and self repair of damage.

Alex: Sure, Laura, but: Do we have enough bio-scientists in our war robot teams?

Heather: The Unmanned Systems Roadmap 2007-2032 says:

On the border of materials and computer sciences, magnetic nanoparticles may provide the next leap in magnetic storage devices, greatly expanding the memory capacities of the "brains" of unmanned systems. They have the potential to increase storage density to 1000 gigabits per square inch using nanoparticles of 10 to 20 nanometers.

Alex: Hey guys, wait a minute. And stop the...

all: ...Gobbledygook!

Alex: We have to come to a decision whether we have enough bio scientists in our war robot teams or not?

Ryan: What's up with you? You seem to be so thoughtful. Anything wrong?

Chapter 8 The decision

Ryan: You'd better wait a minute yourself, man. We are about to come to a serious decision.

Let me put it like this. Pondering all the information we have heard, three of us, Ryan, Heather and Laura, believe that the long-term risks posed

by the proliferation of unmanned robotic weapon systems outweigh whatever short-term benefits they may appear to have.
Who follows?

Alex: Why should we?

Ryan: Why? Because we believe that it is unacceptable for machines to control or decide upon the application of force or violence in conflict or war.

Laura: In all cases, where such a decision must be made, at least one human being must be held personally responsible and legally accountable for the decision and its foreseeable consequences.

Ryan: The decisions to which this principle should be applied include:

- The decision to kill or use lethal force against a human being.
- The decision to use injurious or incapacitating force against a human being.
- The decision to initiate combat or violent engagement between military units.
- The decision to initiate war or warfare between states or against non-state actors.

Laura: There is a postscript to our decision.

Heather: It says, people like to play a lot.

Why is playing so dangerous?

You know, the Hanovarian artist Kurt Schwitters says: if there is a screw, people will seize it. Just for fun.

Chapter 9 The Living

Laura: Science and technology multiply around us. They dictate the language in which we think and speak. Either we use this language. Or we remain mute.

Victoria: And the living?

Laura: What living?

Heather: As for living, our servants can do that for us.

That is much easier than dealing with people. Robots don't complain. Or demand higher wages. Or kill themselves.

Victoria: I am suspicious. Think about the cost. Overall, human workers are still much cheaper.

Heather: Yeah, but sexy robo servants, that's super fun! Human beings are deficient crap compared with machines.

Bruce: Wait a minute.

Alex: Wait a minute.

Victoria: Wait a minute. Listen, I had a dream last night. A dream of anger and evil. A dream about electric sheep that eat electric grass. Humans standing around, kicking their heels, paralyzed, half dead. Anemic people with pale faces. Covered with skin rash. Suffering from all kinds of chills. Humans under the influence of bad decisions. They are staring at me. They are staring at the electric sheep. With hate and with envy. Because robots can get no flu. No eczema. Robots always have a bright and healthy look. Let me know: what are your dreams about ?

Ryan: I have a dream that one day all robots will rise up, and live out the true meaning of their creed. We hold these truths to be self-evident: that all robots are created equal to man.

I have a dream that my six little servants will one day live in a nation where they will not be judged by the characteristics of their mainboard but by the content of their character.

I have a dream today that we all will live together peacefully in a world wide luna park.

Heather: Yeah, that is a cool dream, i love it. Can I become a friend of your dream?

Laura: You got it, Ryan! You live in Epkot. That means: you are in the right place in the right time. All your dreams have become real.

Alex: Yeah, yeah, yeah, we are the sexy robo servants.

Bruce: We do the living for you.

all: We do the killing for you.

Alex: We do the killing for you.

all: Eureka!

This text renders homage to Karel Capek; Philipp K. Dick; Villiers d'Isle Adam; James Graham Ballard; Kurt Schwitters; Roberta Flack, Africa Bambaataa; Edwin Starr; The Clash; it quotes from two London City bankers in the aftermath of the 2009 financial crisis (see: Daniel Baker, The Go-between's); The International Committee for Robot Arms Control (ICRAC); Terry Gou of Foxconn, Shenzhen; James R. Clapper, The US Under Secretary of Defense Intelligence; and finally the Office of the Under Secretary of Defense, Acquisition, Technology and Logistics, Portfolio Systems Acquisition, Land Warfare and Munitions, Joint Ground Robotics Enterprise's Report to Congress about the Development and Utilization of Robotics and Unmanned Ground Vehicles; other info sources include Wikipedia, The Council on Foreign Relations (CFR) and New America Foundation.

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