Artificial Intelligence (AI) For Defense and Military Uses

Capers Jones **Version 12** **September 24, 2024**

(Picture of a female robot soldier controlled by artificial intelligence)

ABSTRACT

Artificial intelligence (AI) is a new technology that is changing many fields. One of these is the way military equipment will be operated. Instead of human pilots, new aircraft will be controlled by artificial intelligence. There are also AI submarines without crews, and AI-controlled battle tanks. This article shows recent examples of AI-designed and operated military equipment.

Note 1: The AI tool Google Gemini was used for fact checking in this draft. Many of the illustrations were produced using artificial intelligence.

Note 2: The author recently gave two talks about artificial intelligence. The first was requested by the Air Force and covered new weapons controlled by AI. The second was the Artificial Intelligence conference in Beijing in August, where the author was the invited keynote speaker.

As of 2024 AI-generated illustrations cannot be copyrighted. This means that new books using AI-generated illustrations will have many more illustrations than older books on the same topics.

ARTIFICIAL INTELLIGENCE FOR DEFENSE AND MILITARY USES

INTRODUCTION

One of the most important uses of AI will be for military and defense activities. The United States, China, Russia, and all other countries are building new generations of AI controlled aircraft, ships, spaceships, tanks, and other weapon systems. This could greatly reduce casualties in warfare and military actions.

Computer-controlled pilotless military aircraft and drones have added new capabilities to world military forces. They can fly dangerous missions without risking loss of pilots and crews.

Current use is mainly reconnaissance over hazardous terrain and at sea over enemy surface ships. They can also be used as cruise missiles with high-precision accuracy to minimize risks of collateral damage to innocent bystanders. Soon autonomous weapons and even armed killer robots will be seen on battlefields.

NOTE: The images in this chapter were all created by artificial intelligence. The method used was the phrase: **"Pictures of …… created by artificial intelligence."** Pictures created by artificial intelligence are high quality and cannot be copyrighted.

The first picture was taken in 2024 and shows Russian robot tanks near the Kremlen:

The second picture shows a Russian male robot soldier created by artificial intelligence from 2040:

The second image is a male robot soldier from 2024:

The next picture shows marching robot soldiers controlled by artificial intelligence in 2050:

The next picture shows a future robot submarine controlled by artificial intelligence:

The next picture shows a new AI-guided ship from 2024 for hunting enemy submarines:

Next is a new flying ambulance designed and controlled by artificial intelligence:

The next photo is a new AI-designed and operated hospital ship for carrying patients in hazardous conditions:

Next is a military robot ambulance for transporting wounded troops:

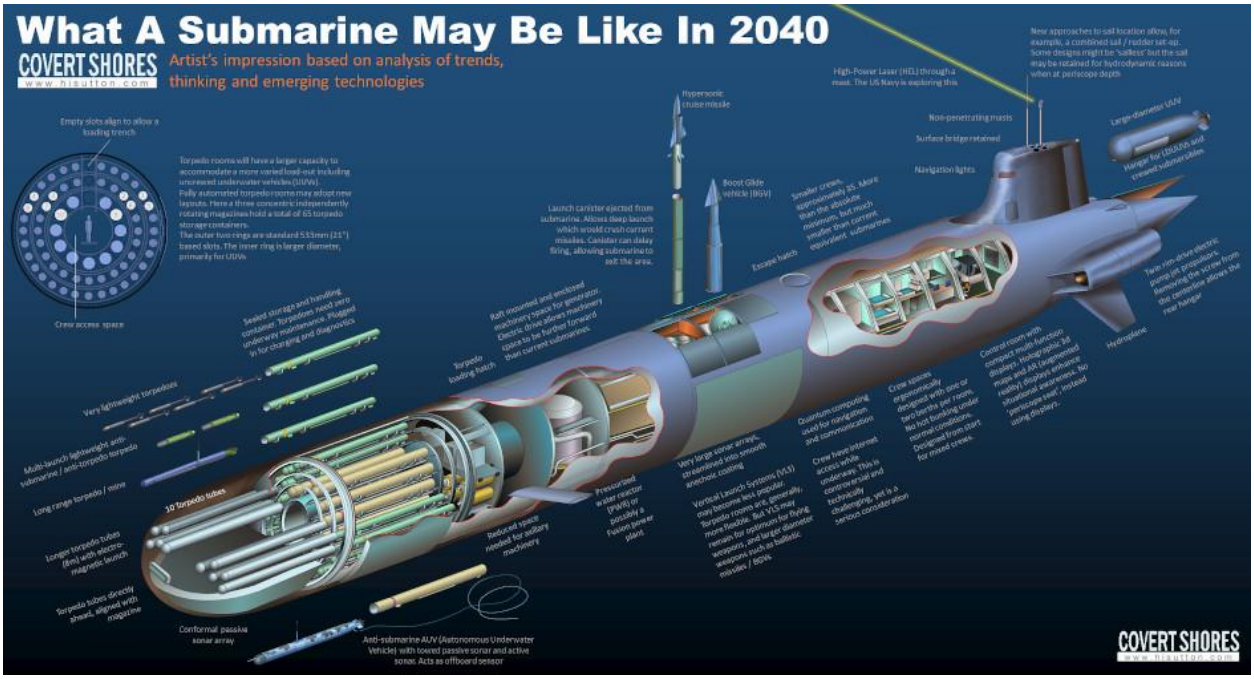
Once at the hospital, robot nurses such as Grade can take charge:

The robot surgeon is discussing the patient with a human surgeon before starting to operate:

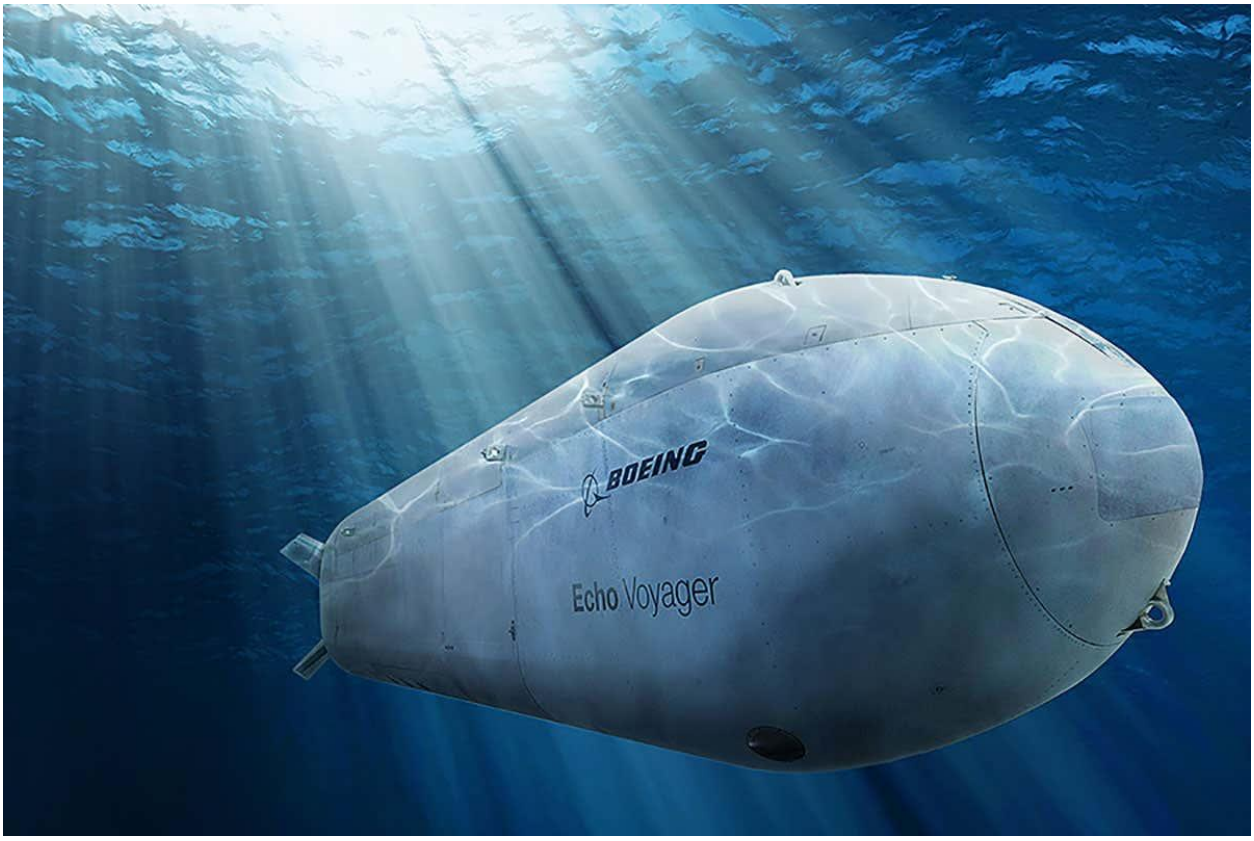
There are also robotic surgeons in both military and civilian hospitals in 2024:

Computer controlled surface ships, tanks, and other military equipment are now being planned and some are under construction. The Air Force has already carried out an experimental dogfight between two computer-controlled aircraft.

The first submarine picture shows a model for 2040:



The next picture shows a new Navy AI-controlled submarine:



Next is a new underwater drone that imitates a shark, and may not be detected because of the way it moves:

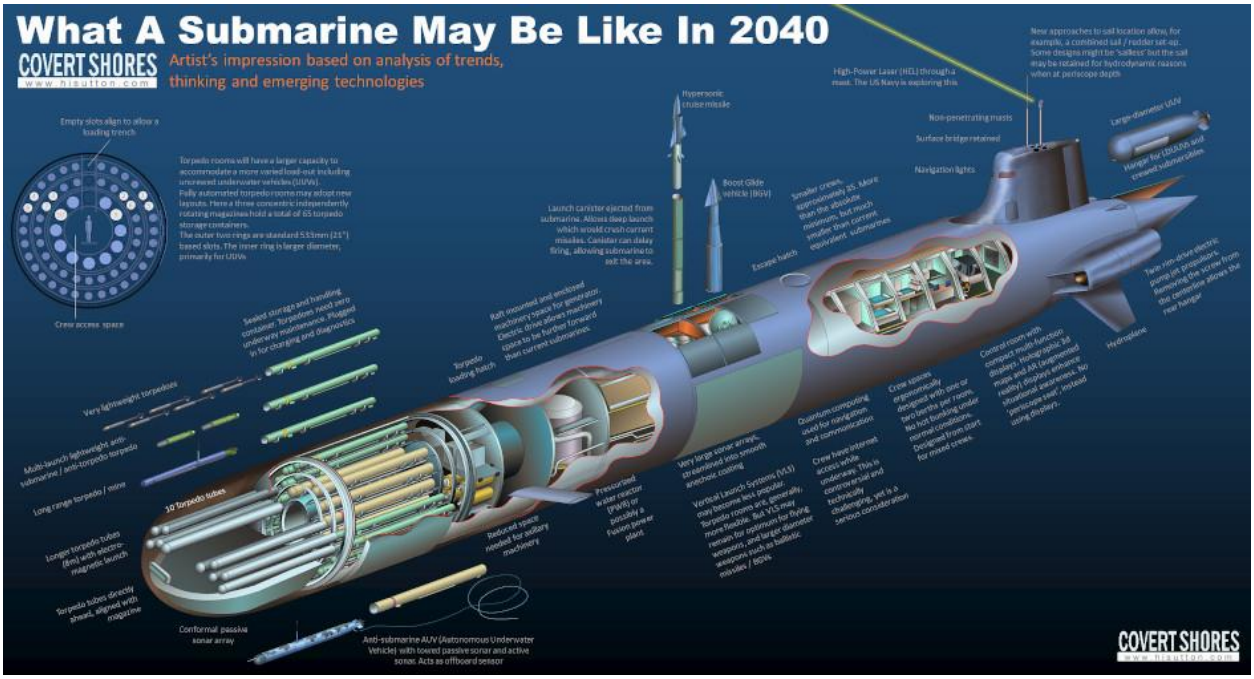
The next root submarine swims with side fins and is also hard to detect:

Small submarines that are controlled by artificial intelligence can also fly to avoid enemy sonar:

Larger autonomous submarines can fly over 1000 miles by 2060:

There are several kinds of AI-controlled submarines for both attack and reconnaissance purposes:

Next is a military design for a submarine in 2040:



Small submarines can be used for reconnaissance and coastal exploration:

Small submarines can be used at night with lights:

Artificial intelligence is one of the greatest inventions of the past 1000 years.

Next is a fantasy flying submarine created by artificial intelligence, but it is not a real military submarine:

Future aircraft carriers will have both piloted aircraft and AI-controlled aircraft:

By around 2060, aircraft carries will be able to fly as well as to float, so they can travel anywhere in the world:

The next two pictures show the designs of new Russian aircraft carriers:

Here is a second Russian aircraft carrier design:

China is also designing new aircraft carriers for AI-controlled planes:

Boeing in developing the concept of a flying aircraft carrier for use over land that can carry AI-piloted aircraft:

Here is another concept for a flying aircraft carrier:

The next image is a possible future submarine aircraft carrier:

The final navy picture shows a new aircraft carrier designed with artificial intelligence and using AI for defensive systems:

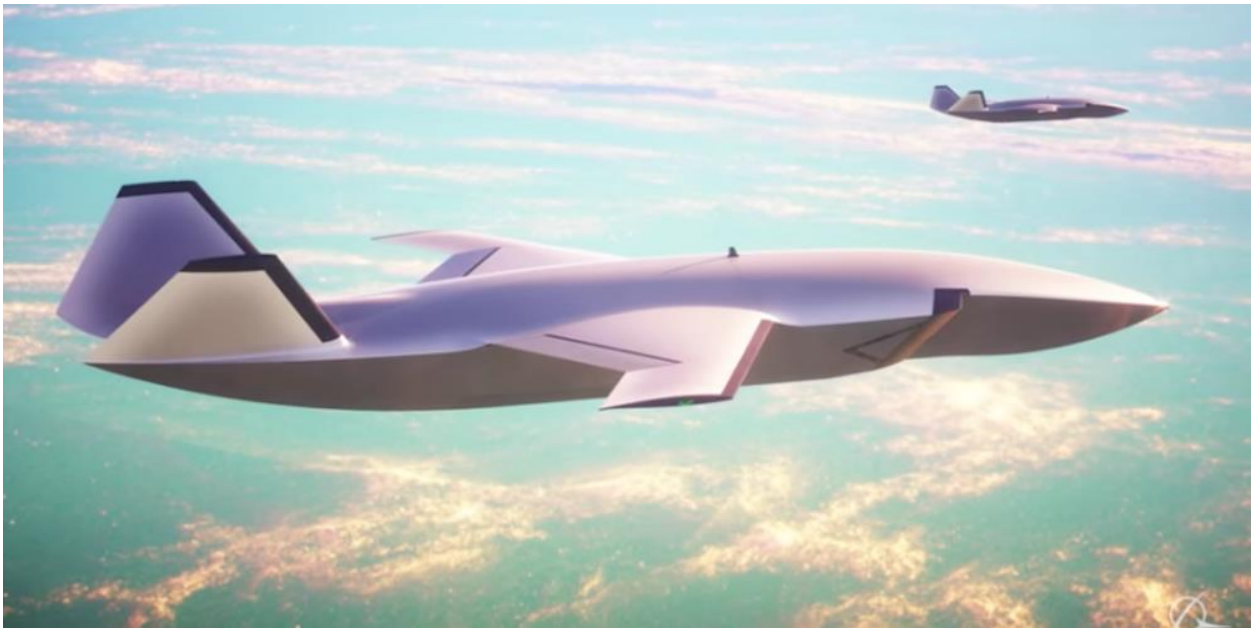
The next picture is an imaginary future flying aircraft carrier designed by artificial intelligence:

We now advance to AI-designed and controlled aircraft.

The first aircraft picture shows a new F35 fighter designed by artificial intelligence and piloted by artificial intelligence:

Next is an experimental high-altitude aircraft designed and operated by artificial intelligence:

The next picture shows a new Boeing design called “Loyal Wingman” for air combat:



The next picture is of a reconnaissance flying wing that can photograph from high altitudes and send back information without risk to humans:

The most advanced military aircraft can fly in space and go around the world:

There are also new AI-designed and piloted aircraft that fly too high to be shot down:

Future military and civilian transport aircraft will be designed by artificial intelligence, and the military versions will be piloted by AI. Civilian planes will probably need a human to keep from alarming passengers:

Next is a possible future cargo plane designed and operated by artificial intelligence:

The next picture shows a Chinese helicopter they are exporting to Iraq and other countries:

Next is a future American helicopter designed by artificial intelligence:

This helicopter can carry a platoon, and is piloted by either humans or artificial intelligence:

The next picture shows a Chinese stealth drone:

In the future, battles may change due to swarms of drones defeating enemy troops and tanks:

The next picture is a Russian AI-piloted plane called Stealth Felon:

Russia is also building a new generation of flying boats:

Larger flying boats could transport over 1000 troops, and could also be used for civilian purposes:

DARPA wants large seaplane cargo jets designed and controlled by artificial intelligence for transporting large and heavy loads to beaches:

The next image is a new high-speed, high-altitude fighter designed by artificial intelligence, but carrying a human pilot:

The next aviation picture shows small drones hovering during a battle in a city:

The last aviation picture shows robots descending with parachutes:

The future of military aviation in all countries will be dominated by AI from now on.

Moving to ground forces, a military picture shows an AI-controlled main battle tank firing a cannon at a target:

The next image is the new Barak tank from Israel designed by artificial intelligence:

This is a future imaginary tank created by artificial intelligence:

The next generation of tanks will be AI controlled as shown by the following pictures, starting with the new U.S. Abrams tank, followed by a new Russian tank:

This is a new Russian tank designed and controlled by artificial intelligence:

This tank is from about 2060 and has no humans on board:

Here is the new U.S. Abrams tank designed and partly controlled by artificial intelligence:

Some AI-designed and controlled future tanks will be amphibious and can go straight to shore from landing boats to establish beachheads:

Here is another AI-designed and AI-controlled small gun platform:

The following picture shows troops walking behind a small robot tank:

Next is a large new robot transport tank:

Here is a future parade of robotic tanks moving through a conquered city:

China and Russia are also developing new AI-designed and controlled ships, aircraft, and surface weapons, as shown by this parade of new Chinese guided missiles:

The next image is a new Russian autonomous weapon vehicle without a human crew:

The next picture shows a robot tank designed for advanced scouting ahead of live troops:

The next illustration shows a modern female combat soldier using a weapon with an artificial intelligence sight:

Here is another illustration of a modern female soldier:

Next is a female robot soldier from 2050 ready for combat:

Next is an AI-generated illustration of a modern male soldier:

This is a male robot soldier from about 2050:

The following image shows a second female robot soldier from around 2050:

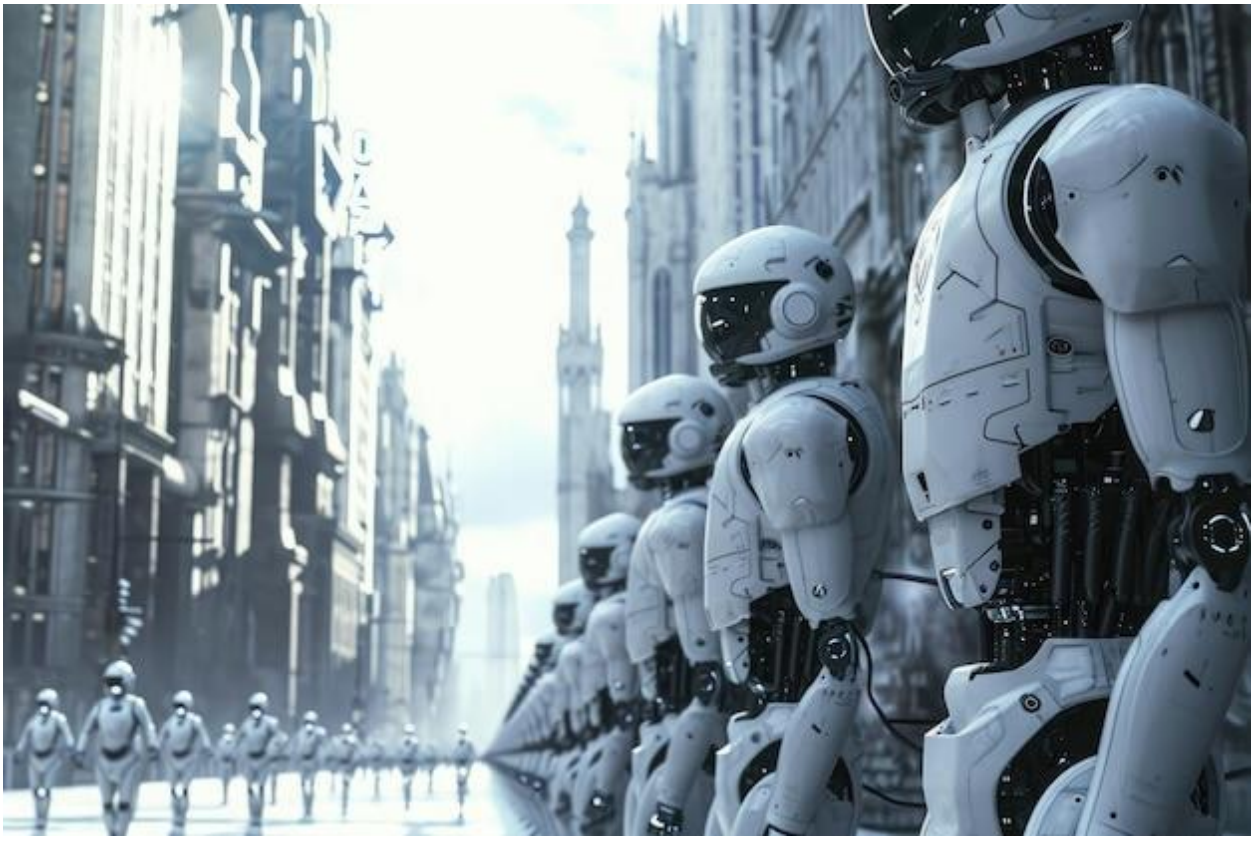
Next is a more human looking male robot soldier, also from 2050:

Next is a robot soldier in winter:

The following image shows a female robot soldier used for interrogations:

Next is a robot parachuting behind enemy lines in 2060:

Next is a future army of robots marching from around 2080:



The next image shows a live U.S. female soldier wearing a protective self-powered external suit that provides protection and make running faster:

A modern soldier in 2024 wearing a new protective suit looks like an ancient Samurai from 1224:

The next image shows a male robot soldier from around 2050:

Next is a female robot soldier, also from 2050:

Protective modern external suits can also help against gas attacks:

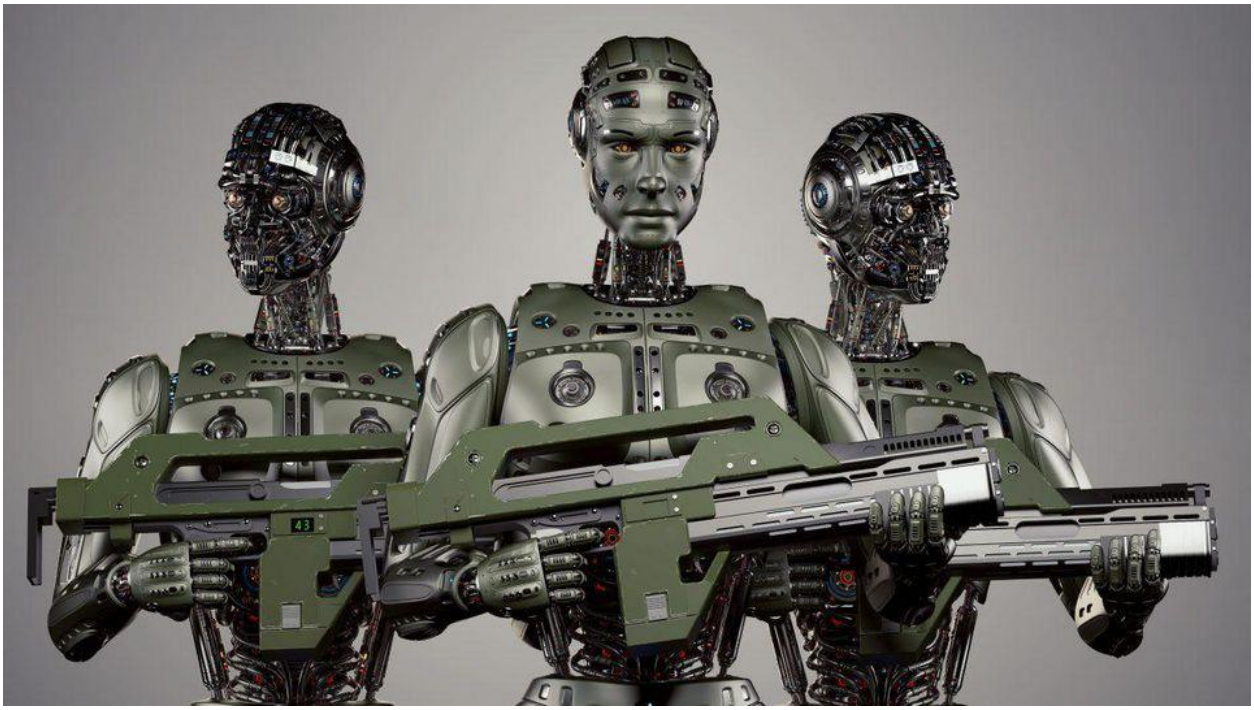
The next picture shows another army of military AI-controlled robots ready to be deployed:

The next image shows a future tank from around 2027 in winter:

Following is a tank in winter firing a cannon:

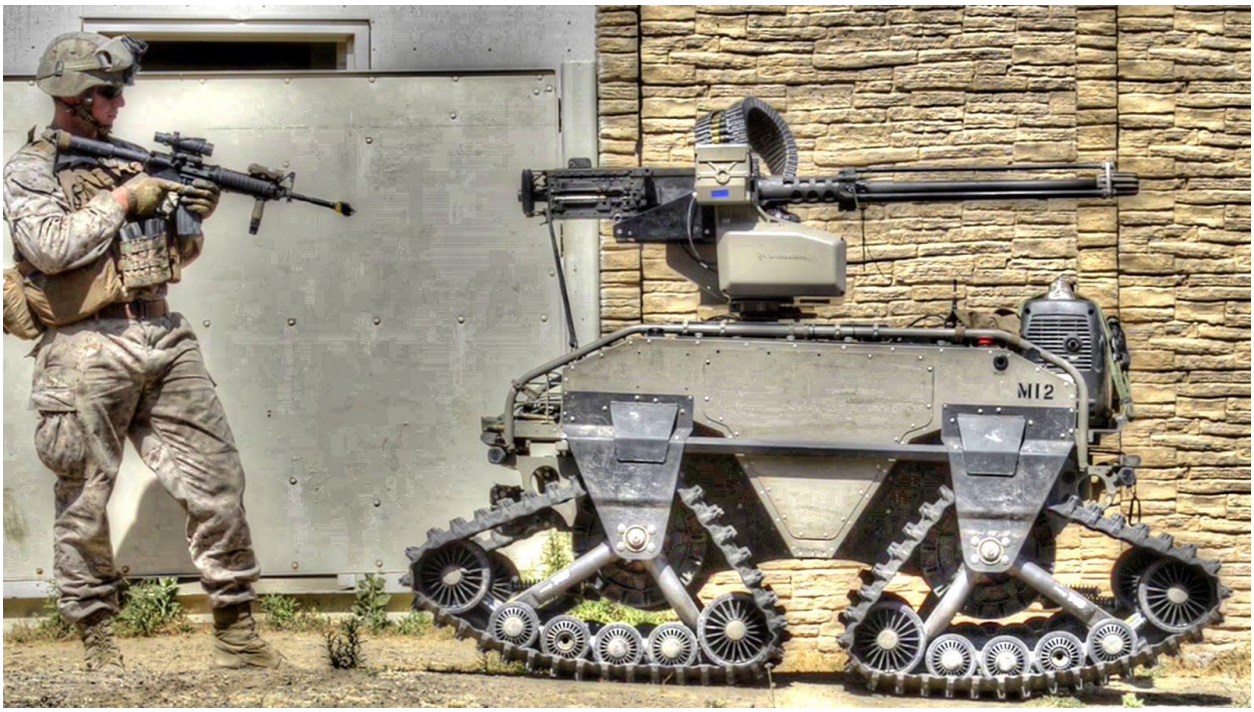
Here is an image of a winter tank battle created by artificial intelligence:

Here are new Chinese robot soldiers ready to fight in 2024:



The next picture shows a large future robot tank circa 2050:

The next picture shows a small AI-controlled tank for close fighting on battle fields and for combat without risking human lives:



Within a few years the military will have AI-controlled aircraft, battle tanks, cargo carriers, drones, long-range missiles, spaceships, surface ships, and submarines.

The next picture shows a bullet-proof rescue robot that can assist in moving wounded soldiers from battlefields under enemy attack:

Small driverless transport vehicles already exist and can be used to resupply frontline troops:

Next is a photo of an Iranian drone tank controlled by artificial intelligence:

The next image shows a U.S. soldier holding a small drone used for battlefield observations and scouting head of troops:

AI is transforming all aspects of defensive systems: ground, air, sea, and undersea.

Here is another image of a future AI-designed and controlled tank:

Without human crews to need armor protection, some future tanks will be light enough to fly:

The first picture of robot animals shows two AI-designed and controlled mules for carrying equipment without burdening human soldiers:

The next picture shows a recent photo of a U.S. Air Force robotic dog used to guard aiplanes:

Here is an image of a soldier advancing beside an AI-controlled tank and accompanied by an AI-controlled scout dog:

This is the last robot dog picture:

The next picture shows an armed drone that can hover and use automatic weapons on ground targets:

Photo: ZIAN

Next is a picture of military drones flying over a battlefield:

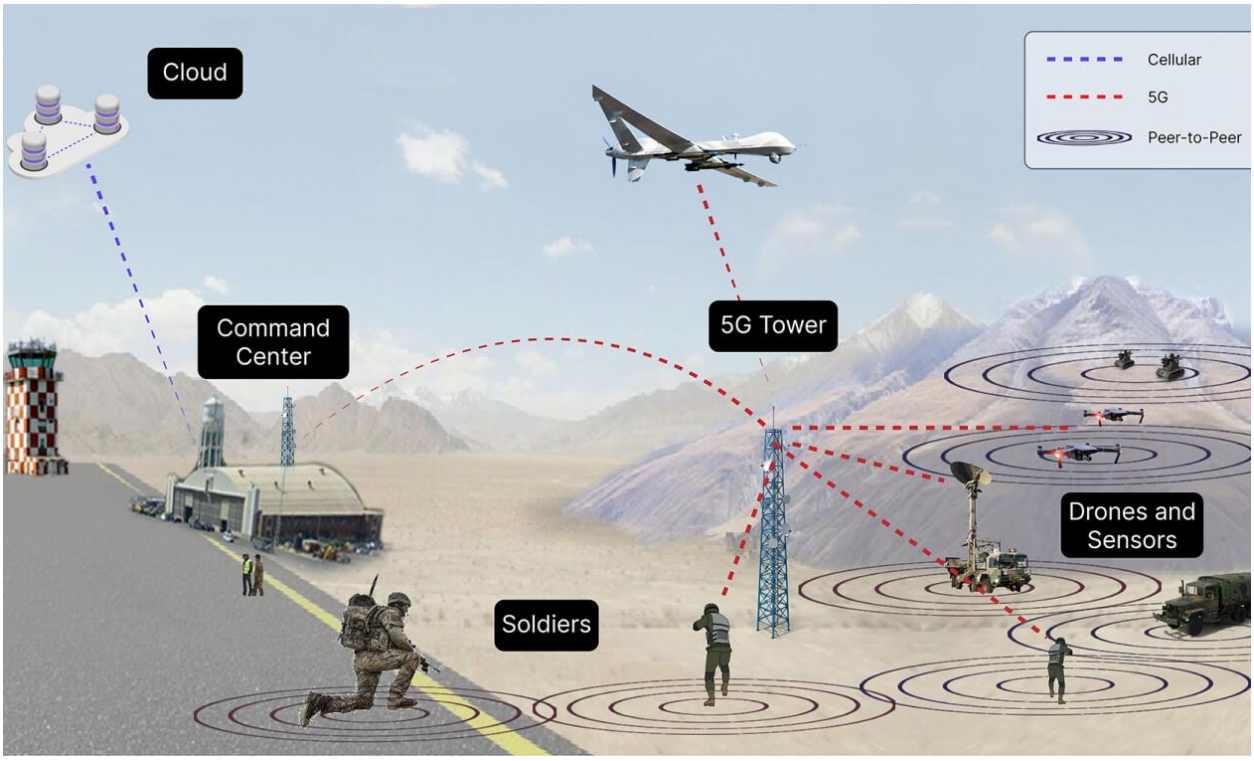
Drones can be used for observation and combat on land:

Drones can also be used as scouts or advanced reconnaissance vehicles before landing operations:

Drones can protect human soldiers in tight urban locations:

Drones can also attack ships, even as far as 500 miles from land:

Next is what a future commander might see when a battle is in progress:



Next is a picture of a future battle fought with AI-controlled aircraft and tanks but very few actual soldiers:

Drones cost between $500 and $20,000. Once fighting is done, drones can also be used for agriculture and civilian uses. The first picture shows a farmer putting pesticide in a drone:

The next image shows a drone used to spray pesticides on fields:

The next image shows a future battle being fought with AI-controlled robot soldiers and AI-designed and controlled tanks:

Large freight- carrying spaceships may be available by 2050:

Also, by 2050 there may be spaceships equipped for combat.

Future long trips in space, and for space battles, robots and artificial intelligence will save human lives:

The next illustration shows a future space combat ship flying over Alaska:

The next picture shows a future space fighter flying over the East Coast in 2070:

Next is an image created by artificial intelligence of a spaceship landing at the White House in 2060:

Next are soldiers on the moon by around 2070:

Here is a future military base protected by artificial intelligence in 2079:

The semi-final image shows an astronaut looking toward the earth by around 2070:

The final image shows the U.S. Space Force on Mars in 2090:

Artificial intelligence is making huge changes in military technologies:

By 2050 a large battle on the surface and in the sky can be fought with no humans.

By about 2070 battles on land, air, and sea may have no humans.

By 2090 a battle in space can take place without any humans.

AI is transforming every major industry and every major country.

Artificial intelligence is moving rapidly through 50 industries, and faster through defense than through most.

Summary of the Impact of Artificial Intelligence on Defense and Military Uses

AI is already creating pilotless aircraft, crewless submarines and surface ships, and AI-controlled battle tanks. There are also AI-controlled guided missiles, and even AI spaceships. Today ships, aircraft, and tanks are almost 100% controlled by humans. Within 10 years the percentage of human crews should drop by over 50%. Within 25 years the percentage of human crews may drop by over 75%.

RECENT REPORTS AND ARTICLES ON ARTIFICIAL INTELLIGENCE

Five Ways Artificial Intelligence will Change the World	NBC News 2023
The Future of AI's Impact on Society	MIT Technology Review 2023
How Will AI Impact the Future of Work	Forbes 2023
Artificial Intelligence News	Science Daily 2023
Artificial Intelligence (AI) Technology	The Guardian 2023
Artificial Intelligence	BBC News 2023

BOOKS ABOUT ARTIFICIAL INTELLIGENCE

The McGraw Hill Illustrated Encyclopedia of Robotics and Artificial Intelligence, McGraw Hill 2022.

Fundamental of Artificial Intelligence: Problem Solving and Automated Reasoning; Miroslav Kubert, McGraw Hill, 2023

The Essence of Artificial Intelligence; Alison Crowly, Prentice Hall; 2023

Philosophy & Artificial Intelligence; Todd C. Moody; Prentice Hall 2023

Artificial Intelligence: A Modern Approach; Stuart Russel and Peter Norvig; Pearson; 2022

READINGS ON HISTORICAL TOPICS THAT TRANSFOMED AMERICA

Starr, Paul; The Social Transformation of American Medicine; Basic Books; Perseus Group; 1982; ISBN 0-465-07834-2. **NOTE: This book won a Pulitzer Prize in 1982 and is highly recommended as a guide for improving both professional education and professional status. There is much of value for the software community.**

Strassmann, Paul; Information Payoff; Information Economics Press, Stamford, Ct; 1985.

Strassmann, Paul; Governance of Information Management: The Concept of an Information Constitution; 2nd edition; (eBook); Information Economics Press, Stamford, Ct; 2004.

Strassmann, Paul; Information Productivity; Information Economics Press, Stamford, Ct; 1999.

Weinberg, Gerald M.; The Psychology of Computer Programming; Van Nostrand Reinhold, New York; 1971; ISBN 0-442-29264-3; 288 pages.

Weinberg, Gerald M; Becoming a Technical Leader; Dorset House; New York; 1986; ISBN 0-932633-02-1; 284 pages.

Yourdon, Ed; Death March - The Complete Software Developer's Guide to Surviving "Mission Impossible" Projects; Prentice Hall PTR, Upper Saddle River, NJ; ISBN 0-13-748310-4; 1997; 218 pages.

SAMPLE OF 10 PUBLISHED BOOKS BY CAPERS JONES

NOTE: a new book by Capers Jones on Artificial Intelligence is planned for publication in 2024. It will be about 300 pages in length and have about 300 AI-generated illustrations. Capers Jones has published 20 books between 1978 and 2023.

1. Software Development Patterns and Anti-Patterns; Taylor Francis, 2022

2. Software Assessments, Benchmarks, and Best Practices; Addison Wesley Longman, Boston, Ma; 2000

3. The Year 2000 Software Problem, Addison Wesley Longman, Boston, MA; 1998.

4. Software Quality – Analysis and Guidelines for Success (International Thomson Computer Press; Boston, MA; 1997).

5. Patterns of Software System Failure and Success; International Thomson Computer Press: Boston, MA; 1995).

6. Assessment and Control of Software Risks; Prentice Hall, Englewood Cliffs, NJ; 1994.

7. Applied Software Measurement; McGraw Hill, 1991

8. Programming Productivity: Steps Toward a Science; Prentice Hall, 1993

9. Software Quality Today; IBM Corporation; 1978

10. Software Engineering Best Practices; IBM Corporation 1978

SAMPLES OF 10 JOURNAL ARTICLES BY CAPERS JONES

Capers Jones has published more than 250 journal articles between 1978 and 2023 in magazines such as Scientific American, IBM Systems Journal, Datamation, Crosstalk, IEEE Transactions on Software Engineering, Cutter Software Journal, and others. This list primarily shows a sample of articles about risks.

1. "High Efficiency Defect Removal Efficiency"; IEEE Software; August 2019

2. "Challenges of Software Project Management"; IEEE Computer; June 2017"

3. "Corporate Software Risk Reduction"; ITT Journal; August 2016

4. "Defenses Against Software Litigation"; IEEE Computer; March 2015

5. "Quality Control for Embedded Software"; IEEE Computer, May 2009.

6. "Preventing Software Failure: Problems Noted in Breach of Contract Lawsuits"; U.S. Air Force software journal *Crosstalk*, June 2008.

7. "Software Defect Potentials"; Crosstalk, Air Force Technology Support Center; December 2007

8. "The Evolution of Defense Software"; *Crosstalk*; Air Force Technology Support Center; November 2004

9. "Conflict and Litigation between Software Clients and Developers"; IEEE Computer; April 2001.

10. "Analysis of Damages due to the Y2K Problem"; IEEE Software; December 2000.

SAMPLE OF 25 OF CAPERS JONES GOVERNMENT CLIENTS

The author was an international consultant for IBM and still consults for his own company, Namcook Analytics. In total the author has consulted with over 95 government agencies and has recently has added the Government of Japan and the State of Florida for artificial intelligence. This table shows a sample of 25 government clients out of 95:

1. Atomic Energy Commission (AEC)
2. Department of Defense (DoD)
3. Deutsche Post (Germany)
4. Homeland Security
5. Internal Revenue Service (IRS)
6. National Aeronautics and Space Administration (NASA)
7. National Security Agency (NSA)
8. U.S. Airforce
9. U.S. Courts (expert witness)
10. U.S. Navy Surface Weapons
11. Government of Canada
12. Government of Hong Kong
13. Government of Japan (artificial intelligence)
14. Government of Malaysia
15. Government of Singapore
16. Government of South Korea
17. Government of Quebec
18. Government of Thailand
19. State of California
20. State of Florida (artificial intelligence)
21. State of New York
22. State of Oregon
23. State of Pennsylvania
24. State of Rhode Island
25. State of South Carolina

SAMPLE OF 25 OF CAPERS JONES CORPORATE AND ACADEMIC CLIENTS

The author has consulted with over 95 corporate and university clients.

1. American Airlines
2. Amdahl
3. American Express
4. Apple
5. AT&T
6. Bank of America
7. Boeing
8. Dunn & Bradstreet
9. Dupont
10. Ford
11. General Motors
12. Grumman
13. Hartford Insurance
14. Harvard University
15. IBM
16. McKinsey Consulting
17. Microsoft
18. MIT
19. Mobil Oil
20. Nippon Electric
21. Raytheon
22. Walt Disney
23. Wells Fargo
24. Westinghouse
25. Xerox

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