

IT²EC

25 - 27 March 2025
Oslo, Norway

**In the Age of
Artificial
intelligence and
Emerging
Technologies, who
is Really in
Control?**

Andy Fawkes
27 March 2025

Bryan Wells
Chief Scientist
NATO

NATO Public
Forum
July 2024



“... let’s wind the clock back 75 years ...
the defence sector owned the technical futures
... if we wind forward to 2024 ...
commercial decisions by companies
now drive the future of technology across the board ...”

A Long-Standing Curiosity in Military v Consumer Technology

BBC

CATEGORIES

TV

RADIO

COMMUNICATE

WHERE I LIVE

INDEX

SEARCH

Go

BBC NEWS

You are in: UK: England

Thursday, 24 January, 2002, 18:06 GMT

War simulator unveiled

Front Page

World

UK

England

Northern Ireland

Scotland

Wales

UK Politics

Business

Sci/Tech

Health

Education

Entertainment

Talking Point

In Depth

AudioVideo

COMMONWEALTH GAMES

BBC SPORT

BBC Weather

SERVICES

Daily E-mail

News Ticker

Mobiles/PDAs

Feedback

Help

Low Graphics

BBC Wiltshire

WHERE I LIVE >>>

Internet links:

The British Army

Defence Procurement Agency

The BBC is not responsible for the content of external internet sites

Top England stories now:

Tories attack Brixton drugs scheme

Police shoot man on the M6

Leanne killer jailed for life

IVF mix-up heads for court

Inquiry into warship accident

Britain 'sheltering al-Qaeda leader'

Venables named Leeds boss

Transplant first for cancer patient

Links to more England stories are at the foot of the page.



Soldiers sit inside a replica tank to use the simulator

One of the largest war simulators in the world has been unveiled by high-ranking officers from the British Army.

The £290m unit, at the Warminster army barracks in Wiltshire, can recreate a tank battle involving 1,000 armoured vehicles in virtual reality.

The army hope the training simulator will give British troops the edge over any enemy in combat.

The combined arms tactical trainer, CATT, is also designed to reduce the massive costs of live military exercises.

Training 'watershed'

The simulator can reproduce vast sections of terrain from Salisbury Plain and other regions across Western Europe.

BBC

CATEGORIES

TV

RADIO

COMMUNICATE

WHERE I LIVE

INDEX

SEARCH

Go

BBC NEWS

You are in: Science/Nature

Thursday, 20 June, 2002, 13:58 GMT 14:58 UK

Troops in virtual combat

News Front Page

World

UK

England

N Ireland

Scotland

Wales

Politics

Business

Entertainment

Science/Nature

Technology

Health

Education

Talking Point

Country Profiles

In Depth

Programmes

BBC SPORT

BBC WEATHER

cBBC news

SERVICES

Daily E-mail

News Ticker

Mobile/PDAs

Text Only

Feedback

Help

EDITIONS

Change to World



Up to eight soldiers can play together

The British Army is using a specially developed version of the celebrated computer game Half-Life to train its troops.

With the first-person shoot-em-up soldiers can try out new weapons and new tactics without encountering real bullets and bombs.

The Ministry of Defence hopes the system may help reinforce some of the lessons learned on more traditional training exercises.

Like the popular modification, or mod, of Half-Life known as Counterstrike, the army version allows up to eight soldiers to go into virtual combat at any one time.

Obviously, being killed in the virtual world isn't quite so serious

Major Bruce Pennell

See also:

24 Jan 02 | England

War simulator unveiled

23 May 02 | New Media

US military reveals computer game

21 Dec 01 | Reviews

Half-Life revives for new generation

Internet links:

QinetiQ

The BBC is not responsible for the content of external internet sites

Top Science/Nature stories now:

Date for first Australians

Fifth closest star discovered

Mona Lisa smile secrets revealed

The gene that maketh man?

Gravity wave detector all set

Robots get cheeky

The big and the bizarre

Botox 'may cause new wrinkles'

Links to more Science/Nature stories are at the foot of the page.

THINKE

A Little AI Context



Developments in Artificial Intelligence - Opportunities and Challenges for Military Modeling and Simulation

Andrew J. Fawkes
Consultant Thinke Company Ltd
UNITED KINGDOM
andy.fawkes@thinke.co.uk

ABSTRACT

One of the principal themes the NATO Science and Technology Organization (STO) is fostering in 2017 is "Military Decision Making using the tools of Big Data and Artificial Intelligence (AI)". Simulation might play a significant role to play in these developments as it can act as a testbed for such concepts and support the military decision makers in future operations that are enhanced by AI. Simulation is already making a significant impact in the development of AI outside of the defence sector. Companies such as DeepMind and Nvidia are using computer games and simulations to "train" AI and autonomous systems, analogous to humans training in simulations. The rate of progress is high, driven by increases in computing power, availability of data and improved algorithms. AI can now "beat" humans at many computer and board games and is moving towards tackling more strategic games that have parallels with military C2. If such developments translate into the defence sphere then we could foresee humans and autonomous systems training in the same simulation systems, both separately and together, and the AI in the autonomous system being the same as that in the simulation. As autonomous systems proliferate across the nations, M&S technology and techniques might be used to improve the interoperability of autonomous systems. To maximise such synergies, it will be essential that NATO embraces all communities that have an interest in AI. Assessing the risks of potential adversary's use of AI and commercial autonomous systems is also necessary. Despite recent advances, AI development still faces significant technological and ethical challenges and these must be monitored and addressed as necessary.

1.0 CONTEXT

Artificial Intelligence or AI is a technology or concept that has developed over many decades and periodically becomes mainstream news. In the latter half of the 2010s this is still very much the case with regular forecasts of its impact on society, jobs and the world economy. Some of these predictions appear to be nearing reality and AI devices are even entering the home. AI also has the potential to influence and sometimes disrupt the ways that companies and organisations operate and AI-based technology revolutions are anticipated. AI also has enduring impact on media and culture and like much technology it can be considered to have beneficial and harmful uses and its impact has and will have political and ethical implications.

Over the decades many AI predictions have come true to some degree but in some cases not at all or only partially. Good examples of this are to be found in transport where passenger aircraft have considerable levels of automation but society remains some way off from accepting pilotless passenger aircraft. For

STO-MSG-149

11 - 1

2017
NATO M&S
Group



Transforming Joint Air and Space Power
The Journal of the JAPCC

The Future Role of Artificial Intelligence
Military Opportunities and Challenges

By Andy J. Fawkes, Consultant Thinke Company Ltd
By Lieutenant Colonel Martin Menzel, DEU A, JAPCC



Edition 27, Autumn

2018



NORTH ATLANTIC TREATY ORGANIZATION
SCIENCE & TECHNOLOGY ORGANIZATION

TECHNICAL ACTIVITY PROPOSAL

Panel/Group	MSG	Activity Title Training Data Analytics and Standards	
Reference Number	MSG-234		
Activity Type	Research Task Group		
Panel Approval Date 22 Oct 2024	Board Approval Date	Activity Start Date 02 Dec 2024	Activity End Date 02 Dec 2027
Related Activity	MSG-ET-056		
Projected Meeting Location(s)	London, United Kingdom		
Lead Nation(s)	United Kingdom		
Team Leader(s)	Mr Andy FAWKES (United Kingdom) Mr Martyn HARVEY (United Kingdom)		
Panel/Group Mentor	LLOYD, Jonathan (Mr)		
NATO Nations/Orgs Invited to Participate	NATO Bodies		
Non-NATO Nations/Orgs Invited to Participate	PIP GP		
Nations/Orgs Committed to Participate	Germany, The Netherlands, United Kingdom, United States		
Security Classification Level or Marking of the Activity	Releasable to the Public		
Keywords	AI, Analytics, Data Standards, Feedback, Interoperability, Performance, Simulation, Training		
NATO and National Resources Required			

MSG-234 1/3

2025
NATO Training Data
Analytics & Standards

Technologies for Training & Simulation

Defence to
Commercial
Tipping
Points?

Specialised to
Ubiquitous

Technology	Year	Commercial Development
Simulation Software	2007	Bohemia's VBS2
eXtended Reality XR	2013	Oculus Rift
Simulation Graphics	2022	Unreal Engine
Drones	2022	(Ukraine War)
Artificial intelligence	2022	ChatGPT
3D Interoperability Standards	2023	OpenUSD

Thoughts #1 of 2

- **Where we are:**
 - **Increased competition with adversaries leveraging the same technologies**
 - **Growing dependency on external providers**
 - **Need for interoperability with existing defence infrastructure**
 - **Acquisition systems focused on “big ticket” projects**
 - **Ethical, security, and reliability concerns**
 - **Defence still a relatively small market?**

Thoughts #2 of 2

- **Way Forward?**

- **Invest in focused military R&D to address unique needs**
- **Build innovation pipelines with tech companies to ensure continuous capability evolution**
- **Prioritise interoperability using open standards**
- **Develop ethical guidelines for emerging technologies and supporting data**
- **Help educate the workforce on emerging technologies and support warfighter-driven innovation**