



**5th Annual SMI
Future Armoured Vehicles
Weapon Systems
4 June 2020**

New Realities

**a Simulation and
Training Perspective**

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Before



Now



Presentation Overview

The Future of Training (?)



COVID-19 & Training



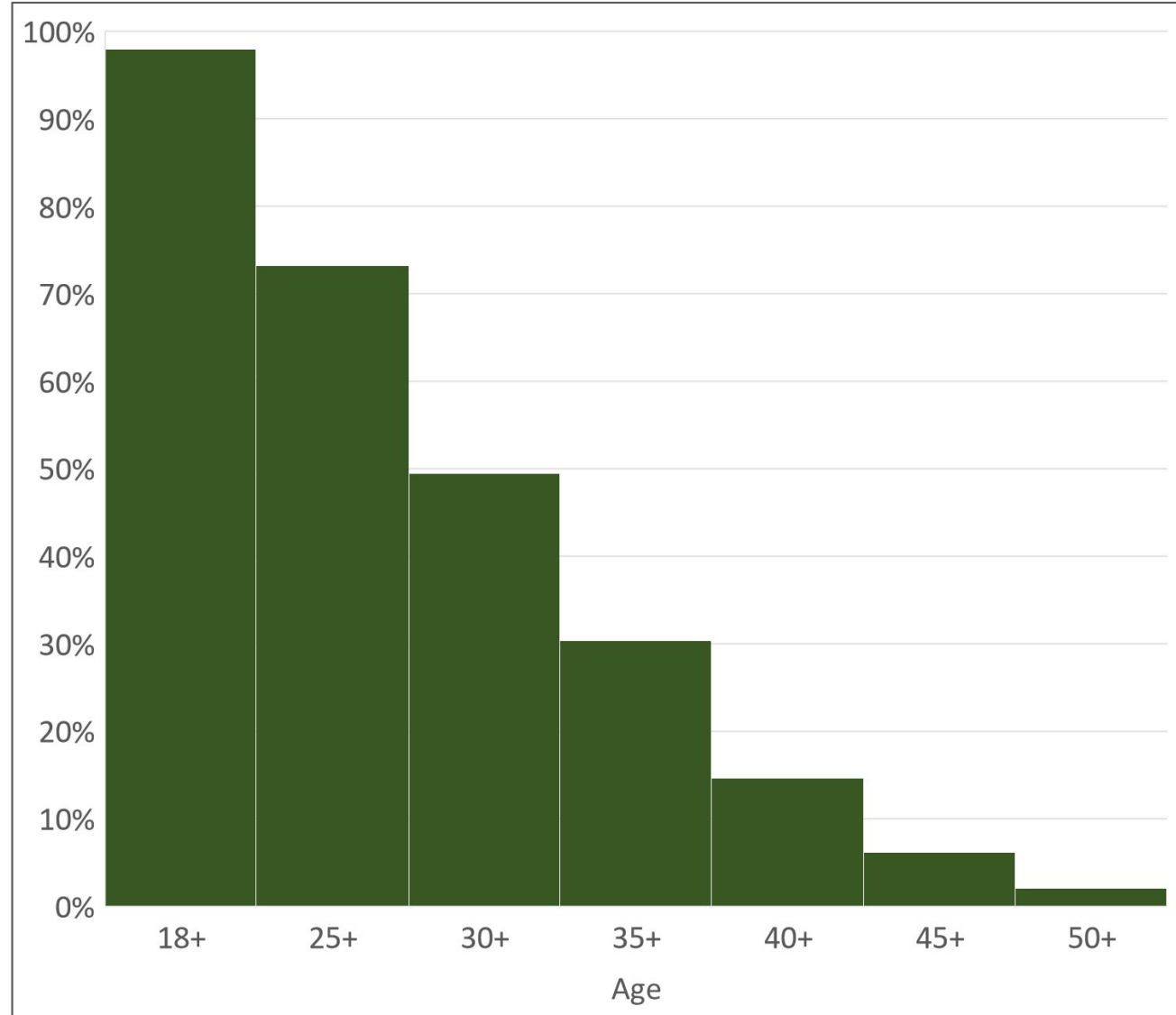
Future of Training



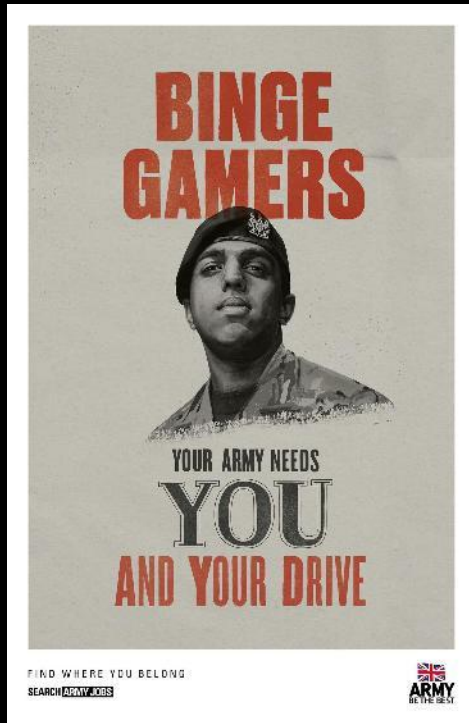
Trainee Centric



British Army Age Distribution

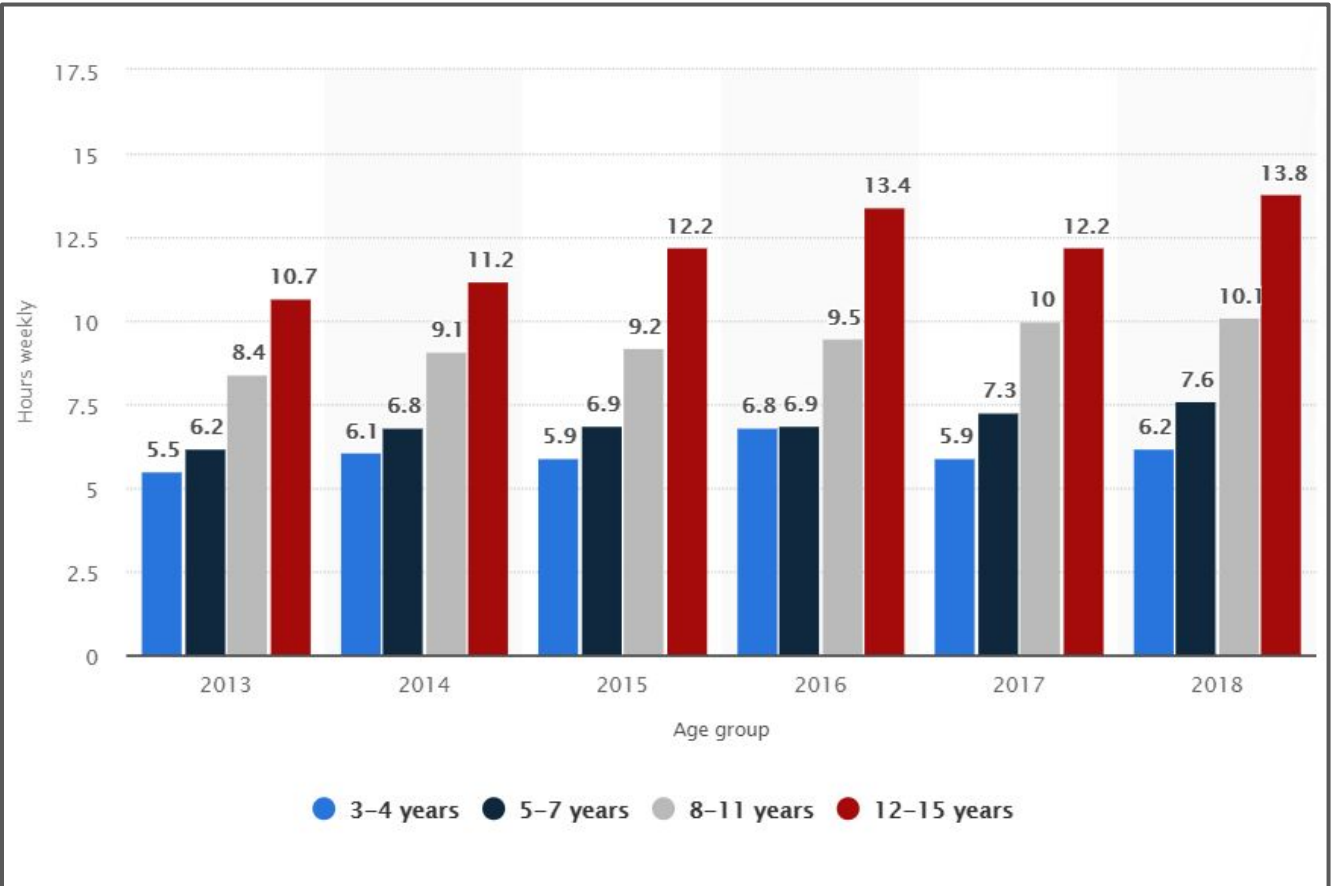


UK Defence Personnel Statistics - CBP7930, 12 June 2018



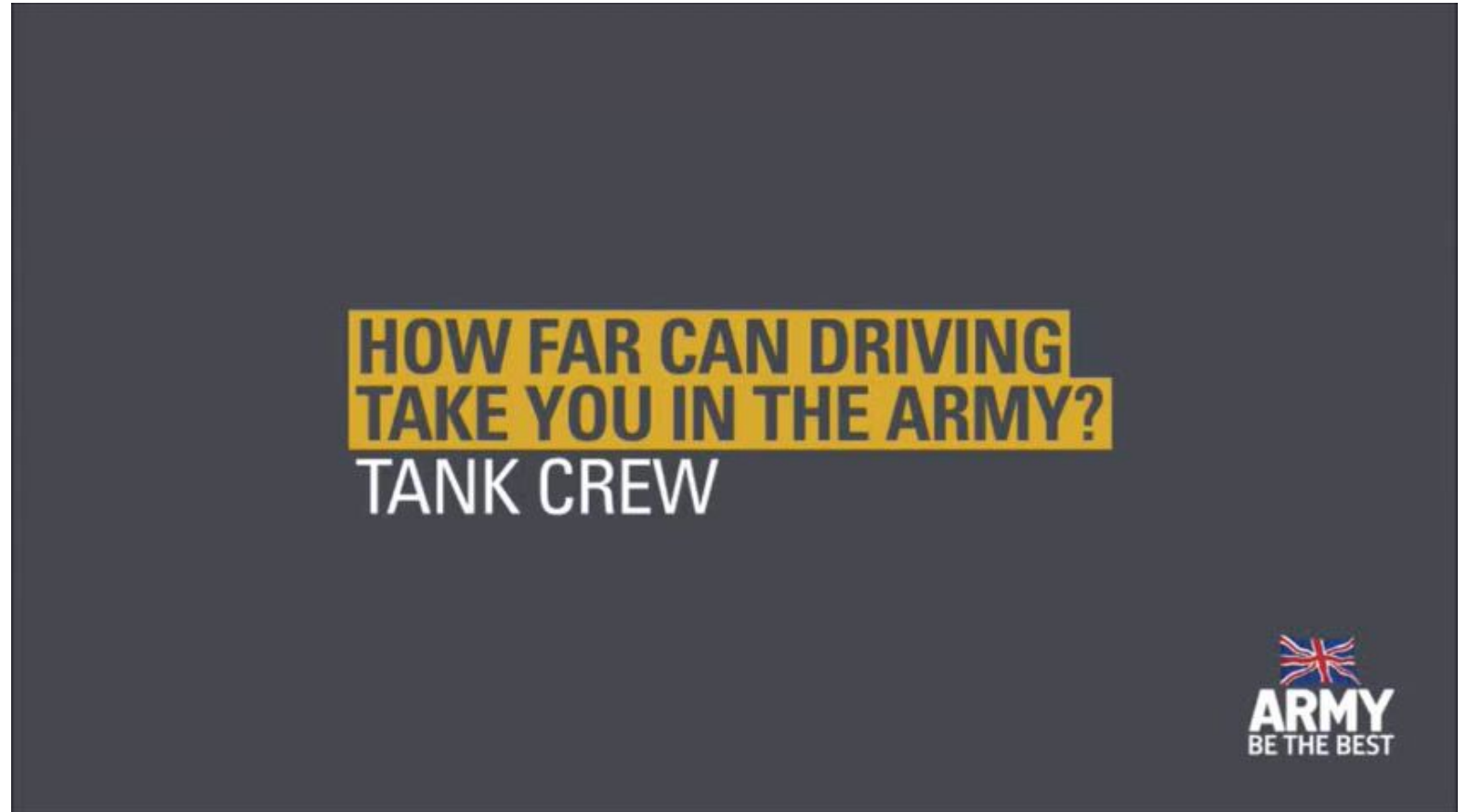
93% of Children Play Video Games

Children's Commissioner for England (2019)





Why Join the British Army? (2016)



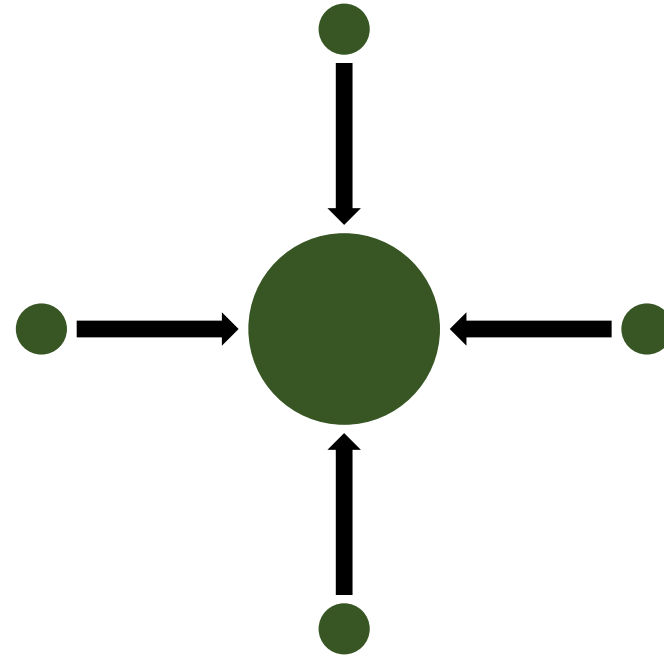
youtu.be/AMl3bW7BdLI

Train Faster, Anywhere, Anytime - Some Quotes

- “fewer people in training”
- “delivering for defence instead of being in training”
- “optimise the syllabus”
- “accelerate learning”
- “trainees at their own pace, and in their own space”
- “training pipelines less tied to specific locations”
- “training more agile to operational demands”
- “Tinder for gunners”

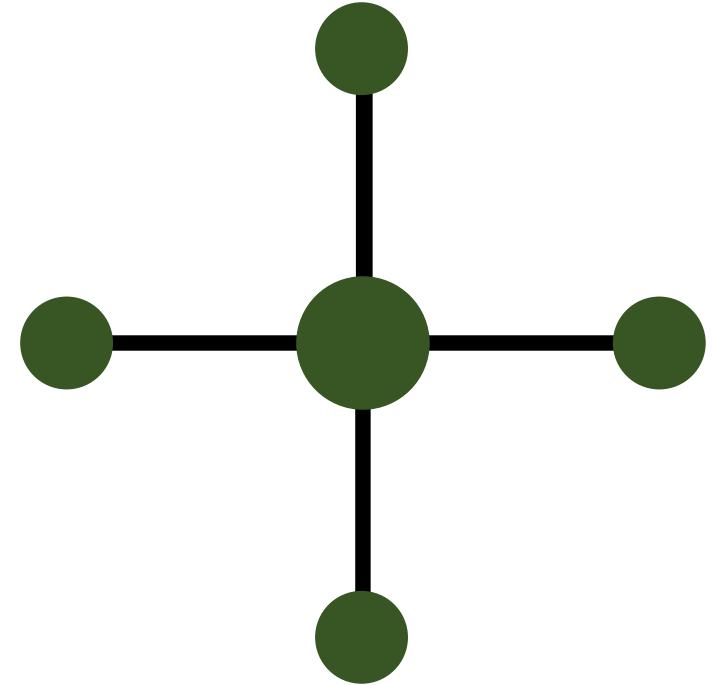
Future Emphasis?

Now



Training Centres

Future



Training Hubs

Trends of Interest

- Next 10 Years

- Simulation
- XR
- AI and Data
- Computing
- 5G
- Digital Twins

Why Use Simulation in Training?



and
now?

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Army halts all basic training and sets up 'virtual platoons' due to coronavirus

The Army says training will continue where possible using online learning tools after face-to-face interaction was postponed indefinitely

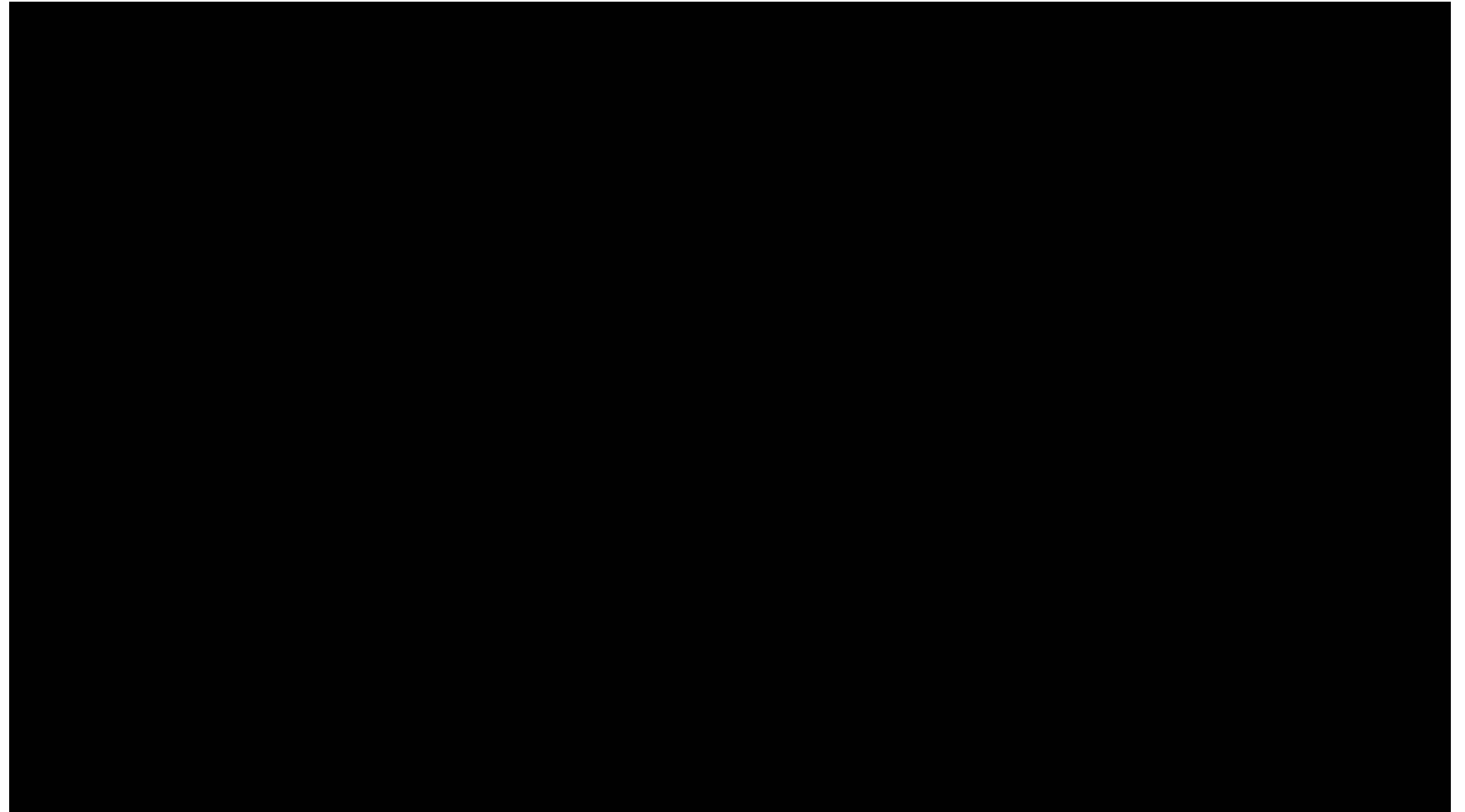
By Dominic Nicholls, DEFENCE AND SECURITY CORRESPONDENT

19 March 2020 • 11:16am



Simulation Some Trends

Unreal 5 (2021)



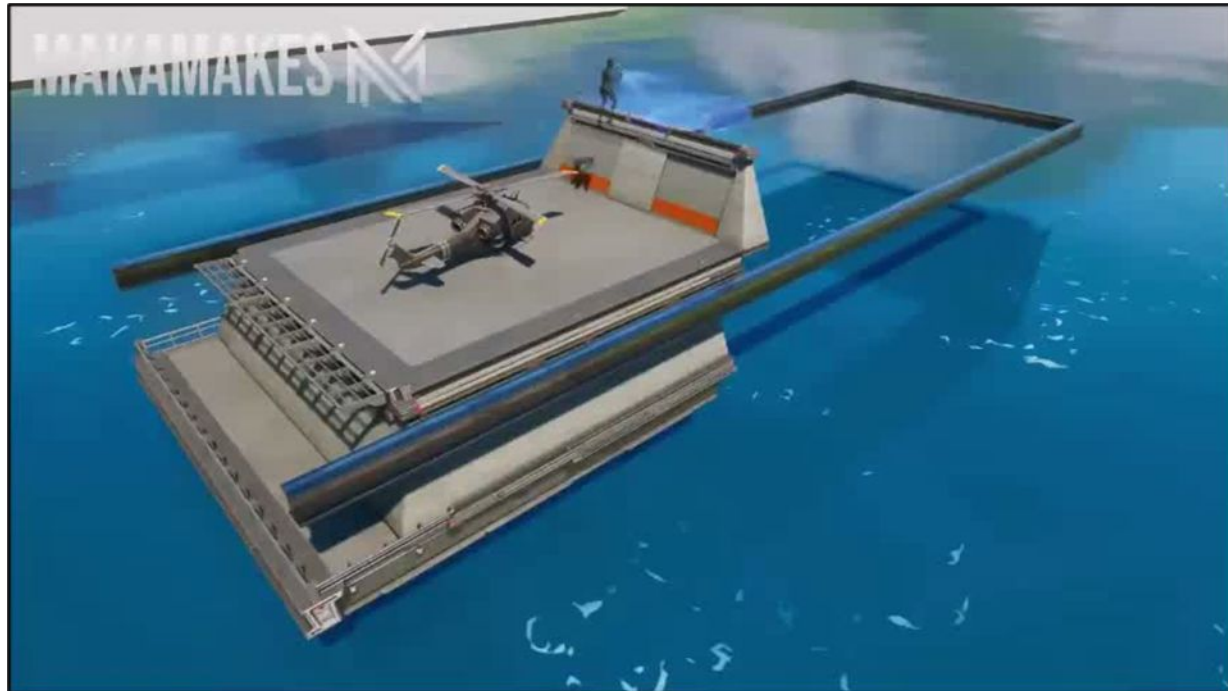
youtu.be/qC5KtatMcUw



Fortnite Party Royale

&

Fortnite Creative



Simulation
(VBS3)

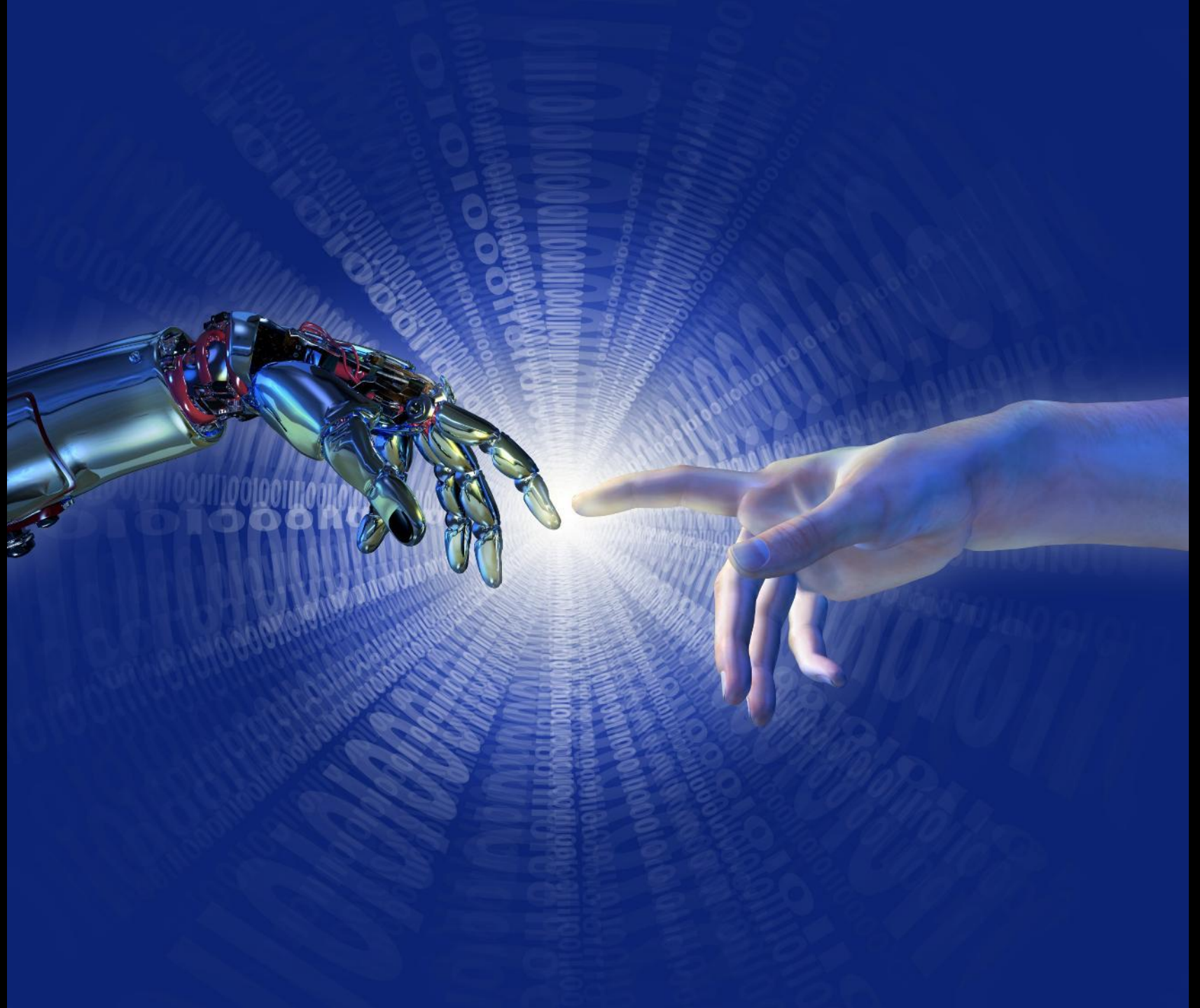
Experimentation

APS
+
Autonomous
Systems



Simulation in Support of Human-Machi ne Teaming

Maximising the Strengths of Both



XR

eXtended Reality (XR)

Reality	Augmented Reality	Mixed Reality	Virtual Reality
The real world	Information layered over vision	Blend of real & digital information to enhance reality	Fully virtual world
			

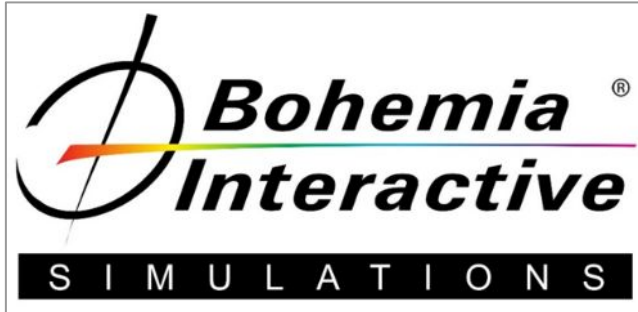
Virtual Reality in Land Training (VRLT) Pilot Q1 2019

- The aim was to identify how Virtual Reality technology might support future Army Team/Collective Training
- 30+ Trainees in VR
- Direct military involvement in the Pilot



VRLT1

Contractor
Team

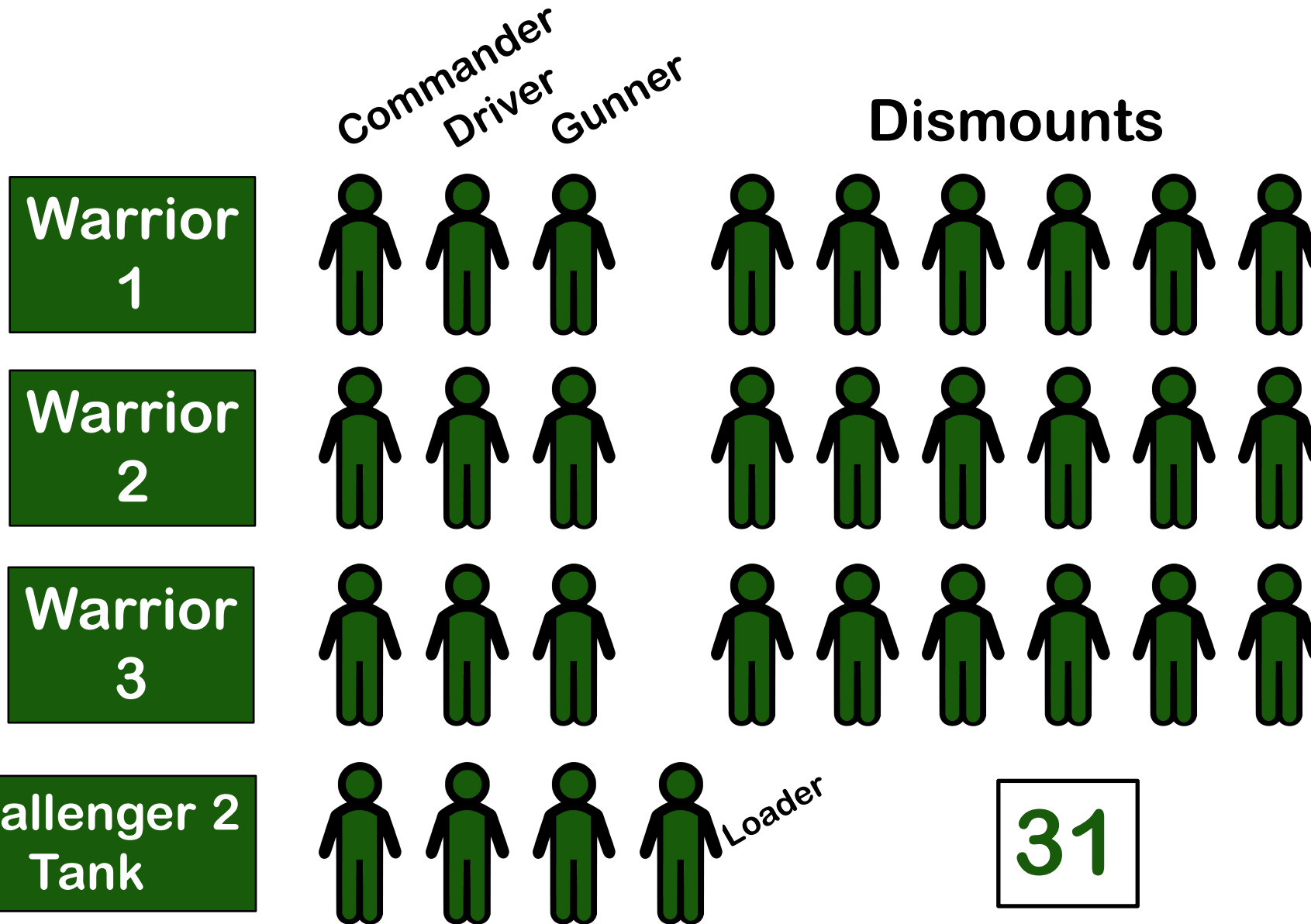


Roke

Part of the
Chemring Group



VRLT1's Principal Training Audience



Why VR for Collective Training?

- Immersive environment creates a challenging environment
- Can rapidly rehearse and repeatedly practice in a variety of scenarios
- Flexible, scalable, deployable and cost effective
- “in desktop simulation you look at the virtual world, in VR, you are in it”





VRLT1

The Video



youtu.be/IOxBOPWej3k



VR-Based Training at Scale (2019)



- 18,500 Lufthansa cabin crew practice safety-related training required by the authorities in 18 VR cabins located in Frankfurt and Munich
- Trainees receive a short introduction from the digital assistant, and during the entire exercise a single panel operator can monitor multiple cabins

MR Varjo XR-1

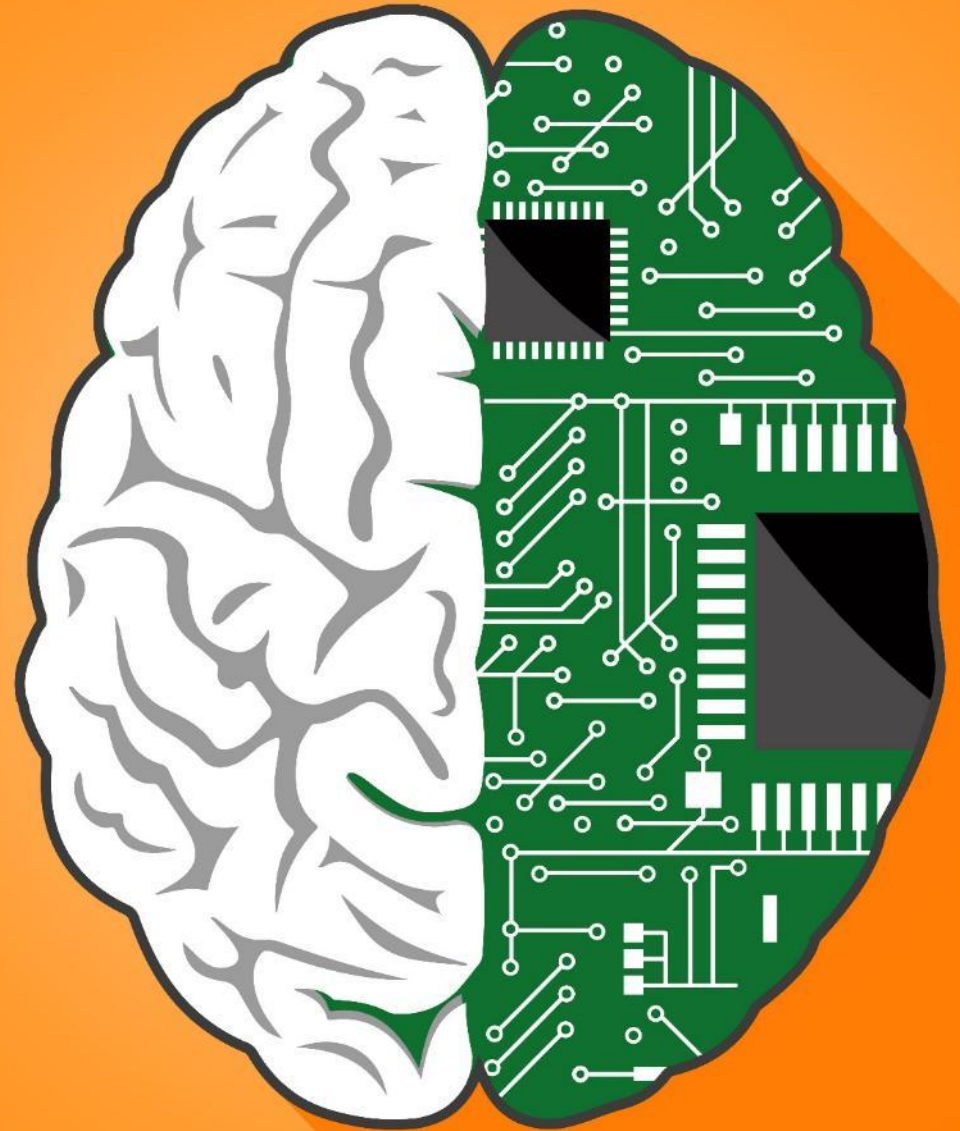


Better Training

- Virtual mentoring/tutor
- Training that automatically adjust to trainee's skill level
- Advanced analytics
- Reduce the need for training

Better Simulations

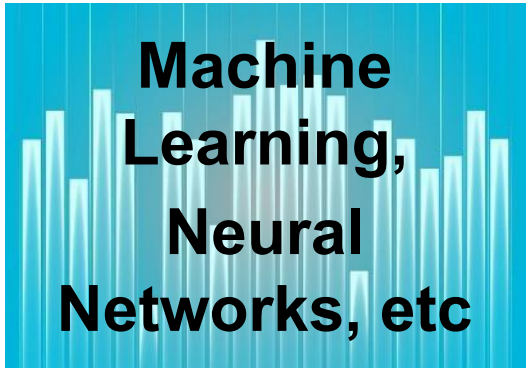
- More cost effective, faster simulation design & production
- Improved simulation AI-driven characters & effects



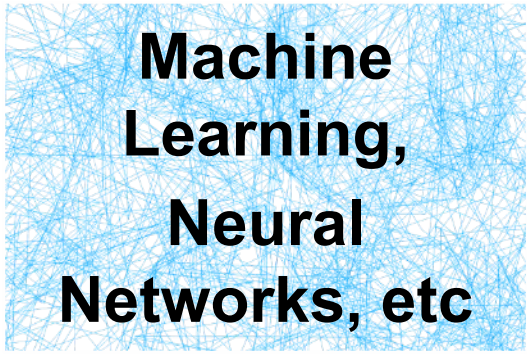
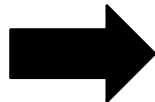
Exploiting Data



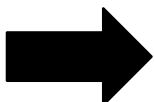
Big Data



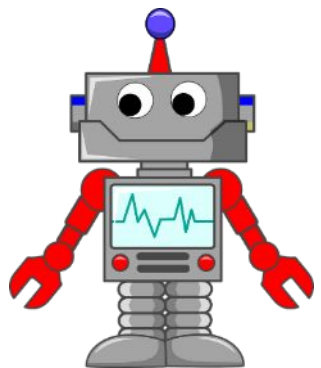
Analysis



“Training”



Human Decisions



Automation

AI Limitations



TECH

A.I. can't solve this: The coronavirus could be highlighting just how overhyped the industry is

PUBLISHED WED, APR 29 2020-1:24 AM EDT UPDATED WED, APR 29 2020-6:47 AM EDT

Sam Shead
@SAM_L_SHEAD

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KEY POINTS

- Big AI firms like DeepMind, OpenAI and Facebook AI have remained relatively quiet throughout the crisis.
- AI has huge potential, but right now scientists are turning to tried and tested technologies instead.
- Of course, there are a few useful AI projects happening here and there.





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Our weird behavior during the pandemic is messing with AI models

Machine-learning models trained on normal behavior are showing cracks — forcing humans to step in to set them straight.

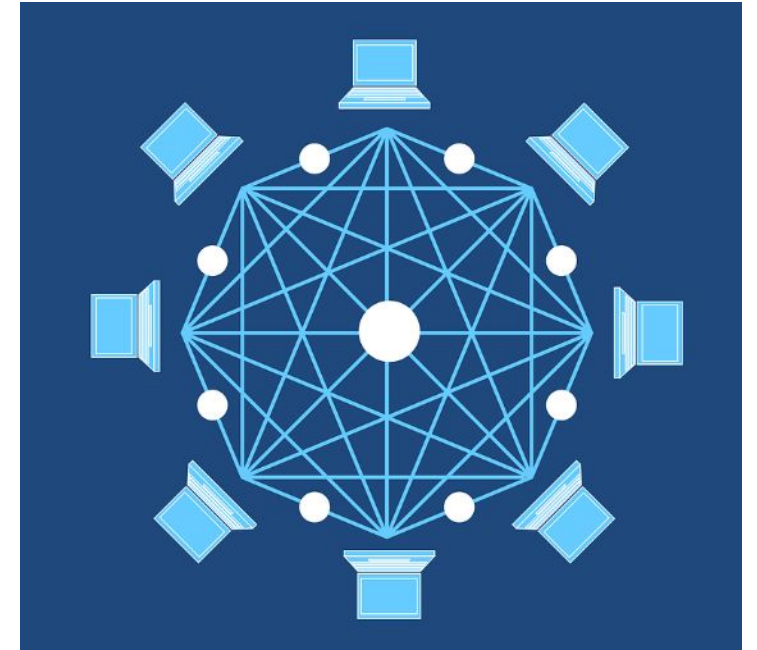
by **Will Douglas Heaven** May 11, 2020

In the week of April 12-18, the top 10 search terms on Amazon.com were: toilet paper, face mask, hand sanitizer, paper towels, Lysol spray, Clorox wipes, mask, Lysol, masks for germ protection, and N95 mask. People weren't just searching, they were buying too—and in bulk. The majority of people looking for masks ended up buying the new Amazon #1 Best Seller, "Face Mask, Pack of 50".

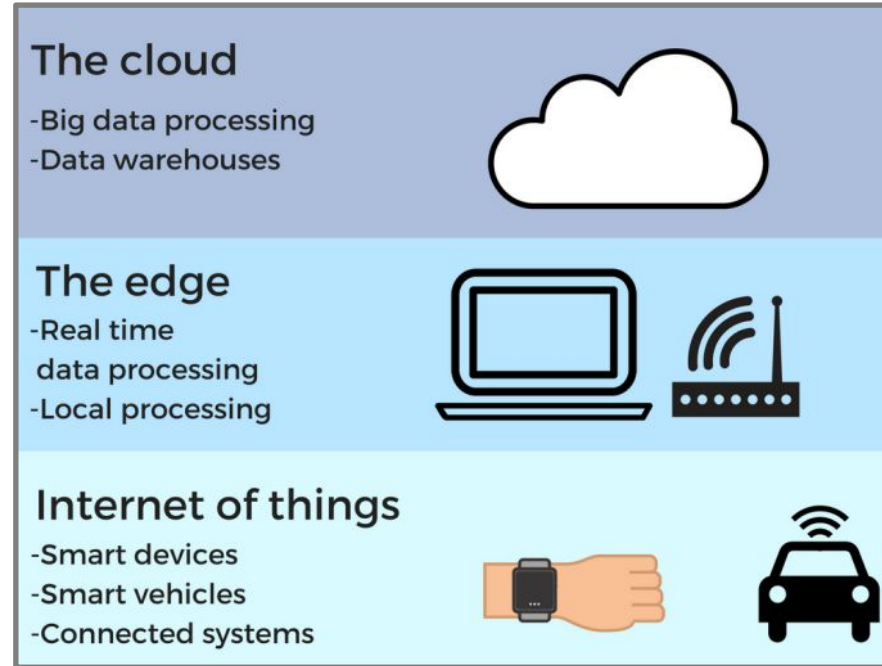
When covid-19 hit, we started buying things we'd never bought before. The shift was sudden: the mainstays of Amazon's top ten—phone cases, phone chargers, Lego—were knocked off the charts in just a few days. Nozzle, a London-based consultancy specializing in algorithmic advertising for Amazon sellers, captured the rapid change in this simple graph.

Blockchain

- Blockchains are a growing list of records, called blocks, that are linked using cryptography
- Many potential applications beyond Bitcoin
- Could host an individual's "Knowledge Score" through his/her academic and working life, securely capturing both in-house and external training and education

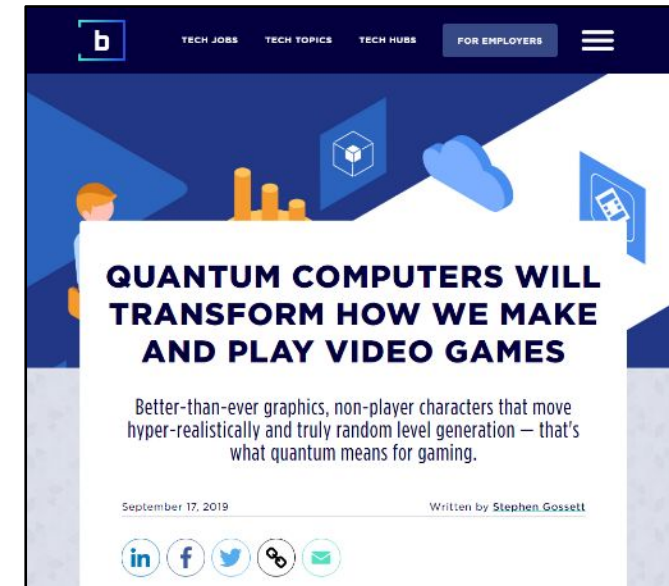
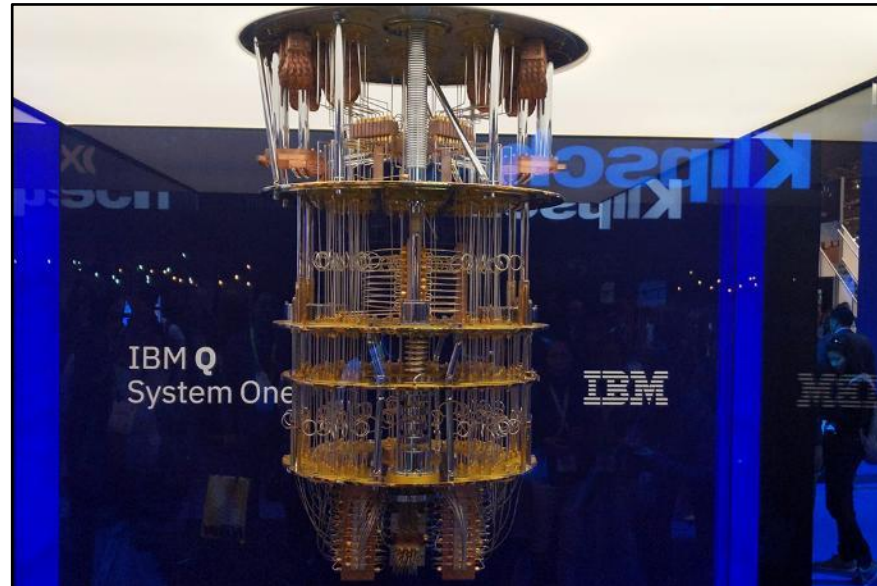


Edge Computing

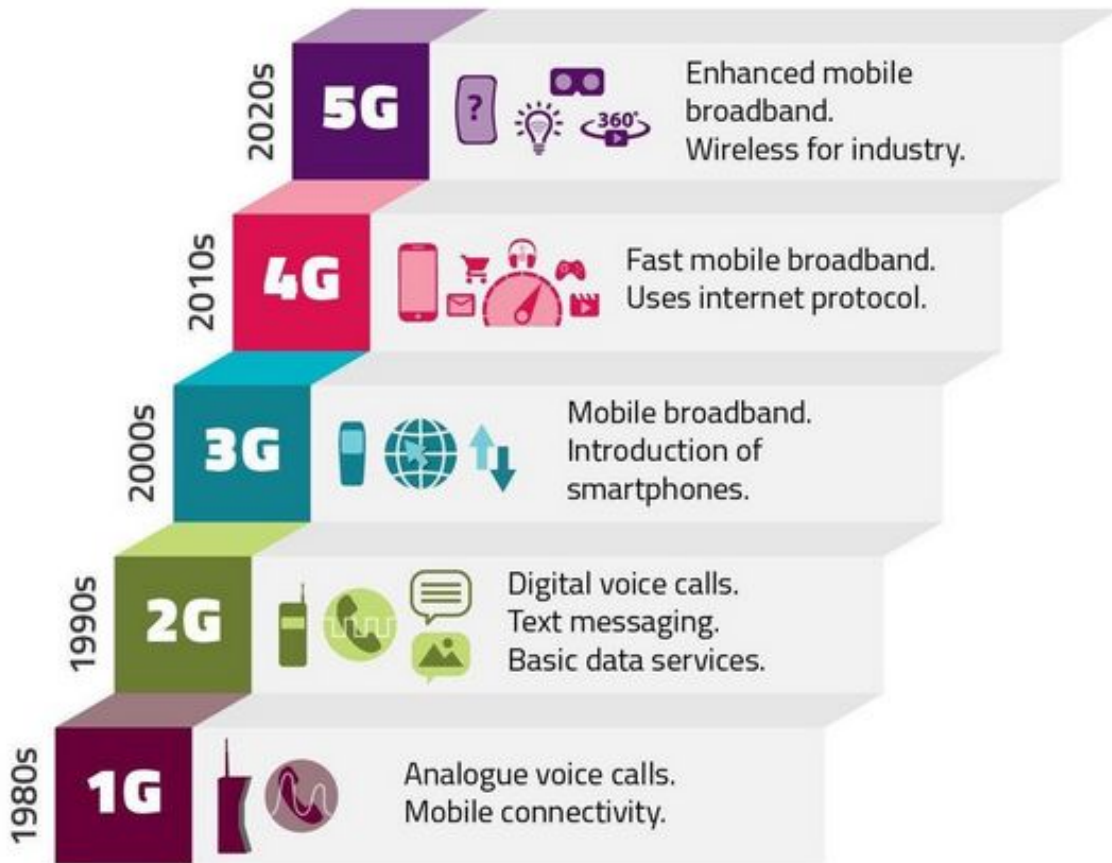


- Data is processed locally, improving response times and saving bandwidth
- Potential to improve distributed training latency and security

Quantum Computing

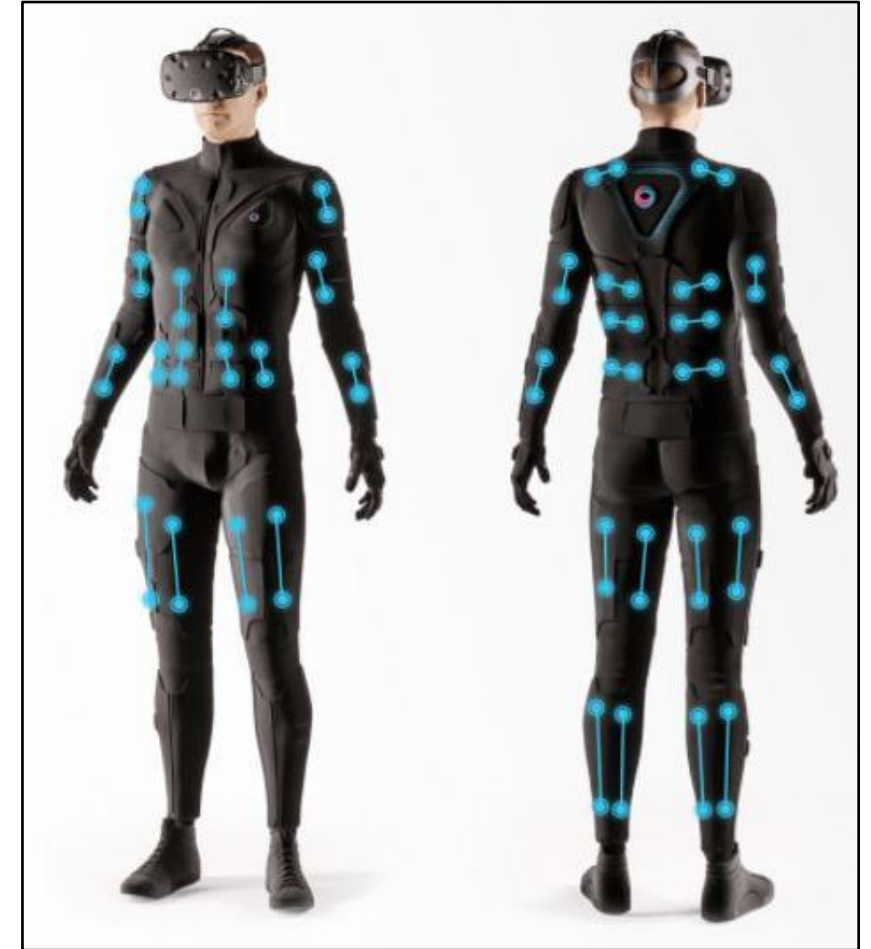
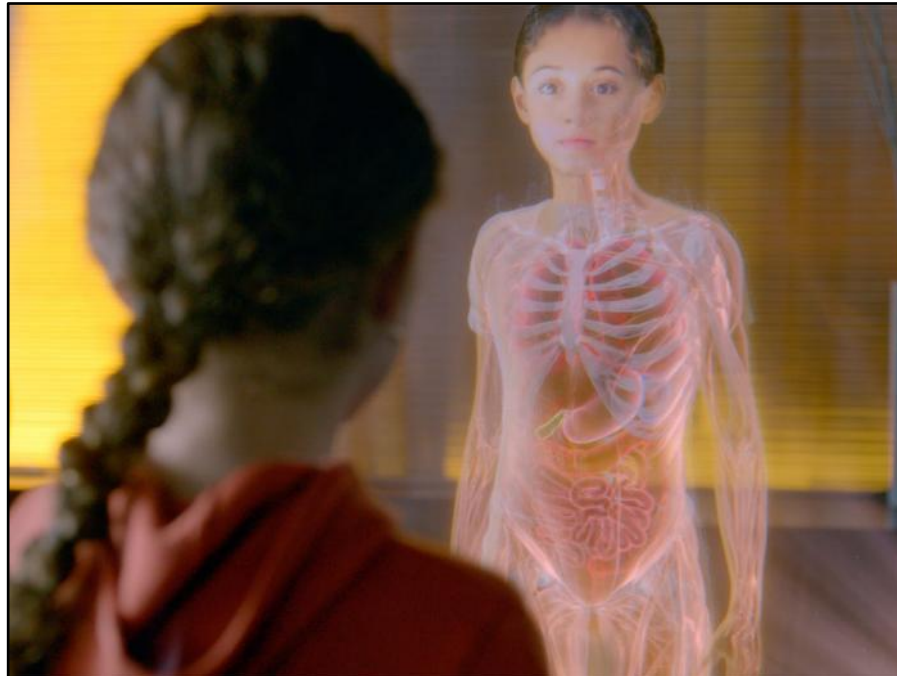
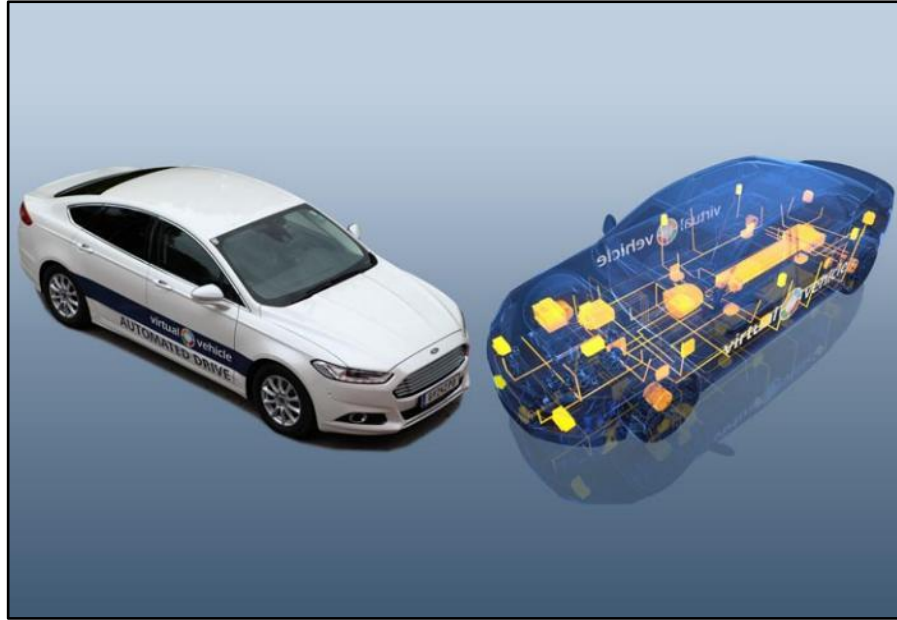


5G



- Faster response times
- Greater Exploitation of the Cloud
- Enhanced Capability for VR/AR, Reducing Local Headset/ Processor Burden
- Improved Live Training Instrumentation

Digital Twins



Teslasuit

Towards the “Metaverse”



Metaverse is a term for the concept of a virtual shared space that converges with actual reality

The convergence of virtually enhanced physical reality and physically persistent virtual space, including the sum of all virtual worlds, augmented reality, and the Internet

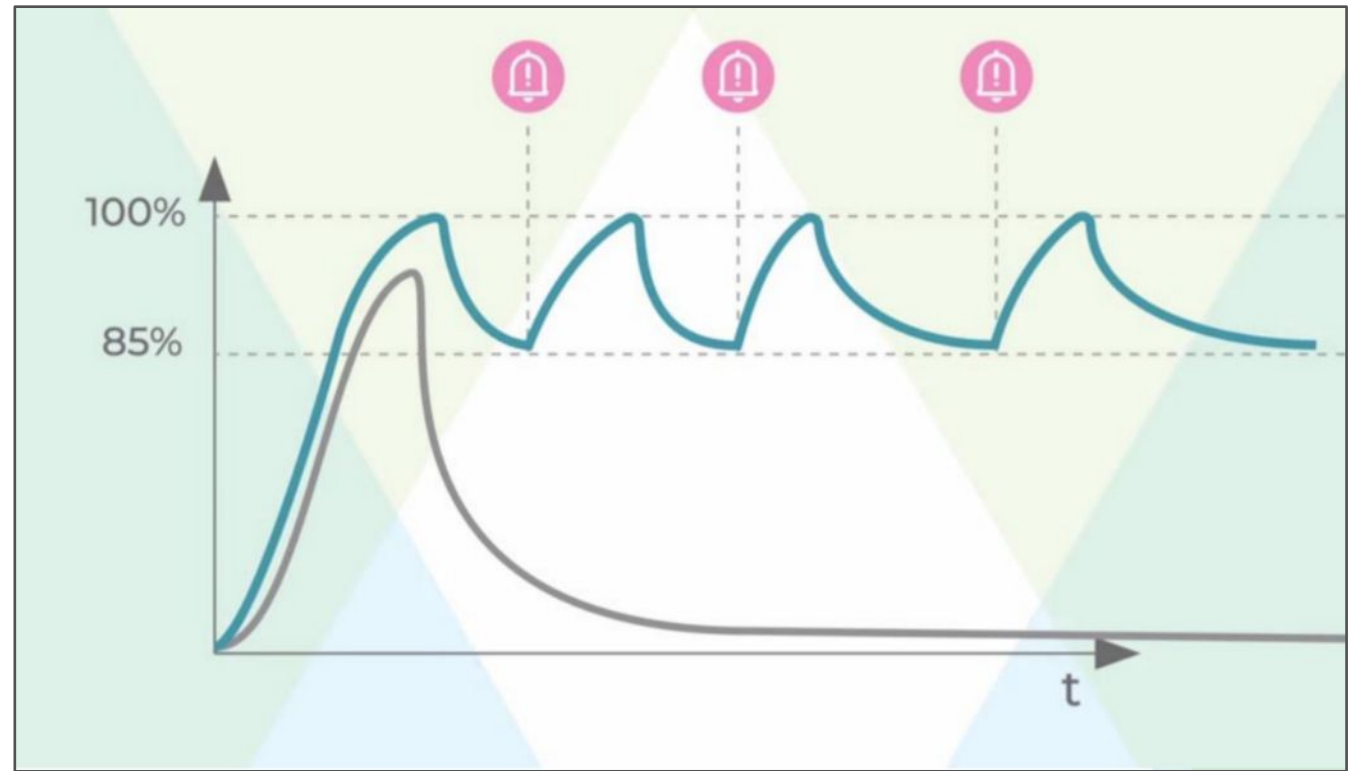
The term was coined in 1992 by Neal Stephenson



COVID-19 & Simulation & Training



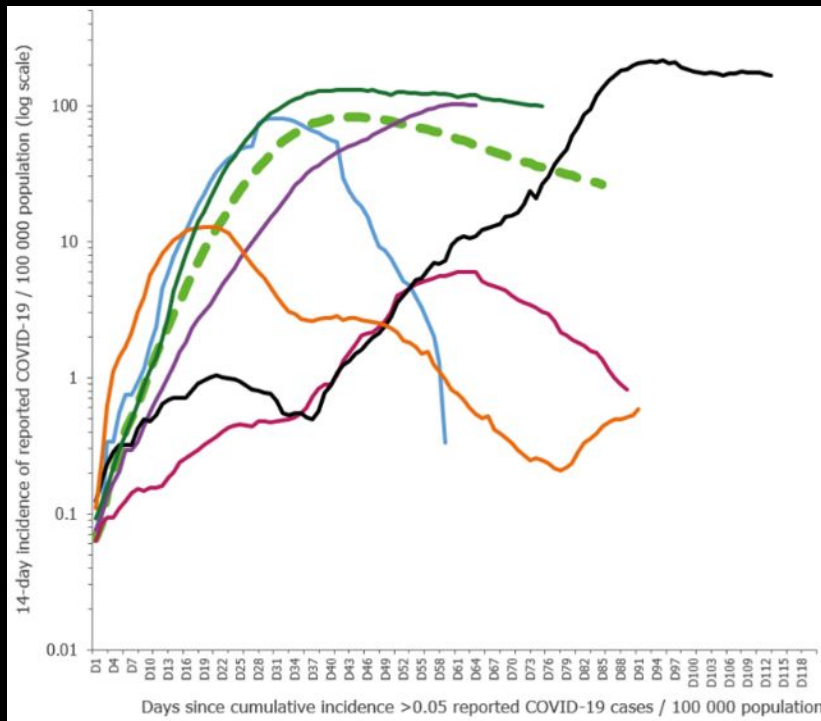
Skill Fade





Defence Priorities and Interoperability

- Reprioritization of resources towards civil defences against such crises, and
- Wargaming and training playing a key role in improving integration and interoperability with civil defences

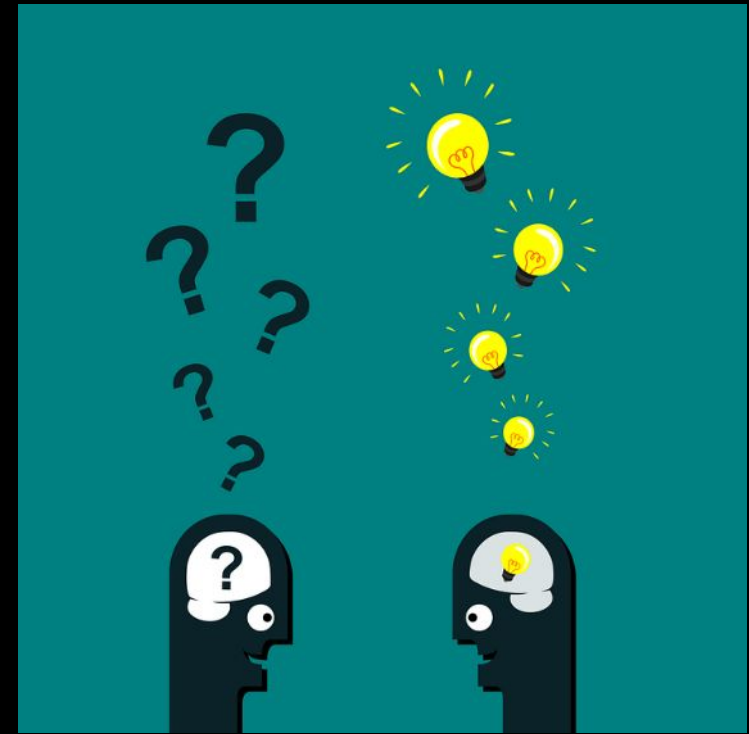


Modelling Uncertainties

- The modelling of the pandemic is a reminder of the balance of political and scientific judgment and bias that surrounds the use of models
- Stressing the need for timely quality data to validate models but also the challenges of the many variables behind the modelling and simulation



Remote Training and Working



Innovation

Remote Training Now



British Army  @BritishArmy · Apr 22

Army recruits and junior soldiers have taken to their gardens and kitchen tables to make sure they're ready for the next phase of their training. Recruits from Pirbright, Winchester and Harrogate have become Virtual Platoons to continue their training. [#InThisTogether](#)



 15

 79

 449

Remote Training Now

16/17 May 20

“Digital Training”



- 18 SNIY soldiers took part in a virtual training exercise
- 22 watching via live stream including US and Australian



Remote Training Now



B Squadron Leader, RWxY
@BSqnLdrRWxY

All set, ready for the start of Exercise Virtual Warrior, the @WessexYeomanry's second virtual training weekend.



 Royal Wessex Yeomanry and 2 others

8:12 AM · May 16, 2020 · [Twitter for iPhone](#)

2 Retweets 68 Likes

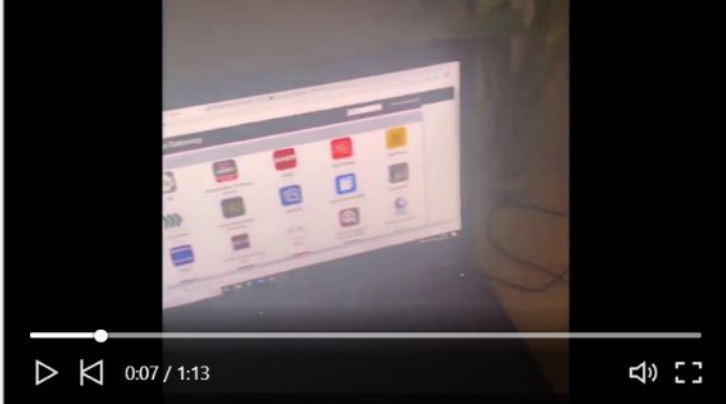




Laura Davies
Voted Top 100 Most Influential Woman in Engineering 2019 - Financial Times & Inclusive Boards.
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3w · 

The Royal Wessex Yeomanry has conducted its first virtual training event. The exercise comprised of a series of tasks intended to test communication skills and virtual working practises. Take a look behind the scenes from my perspective! [British Army](#) [#training](#) [#education](#) [#virtualtraining](#) [#army](#) [#britisharmy](#) [#military](#) [#covid19](#) [#runners](#) [#virtualarmy](#)



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UK Fight Club

“Bottom-up Initiative”

or

Practitioner-led



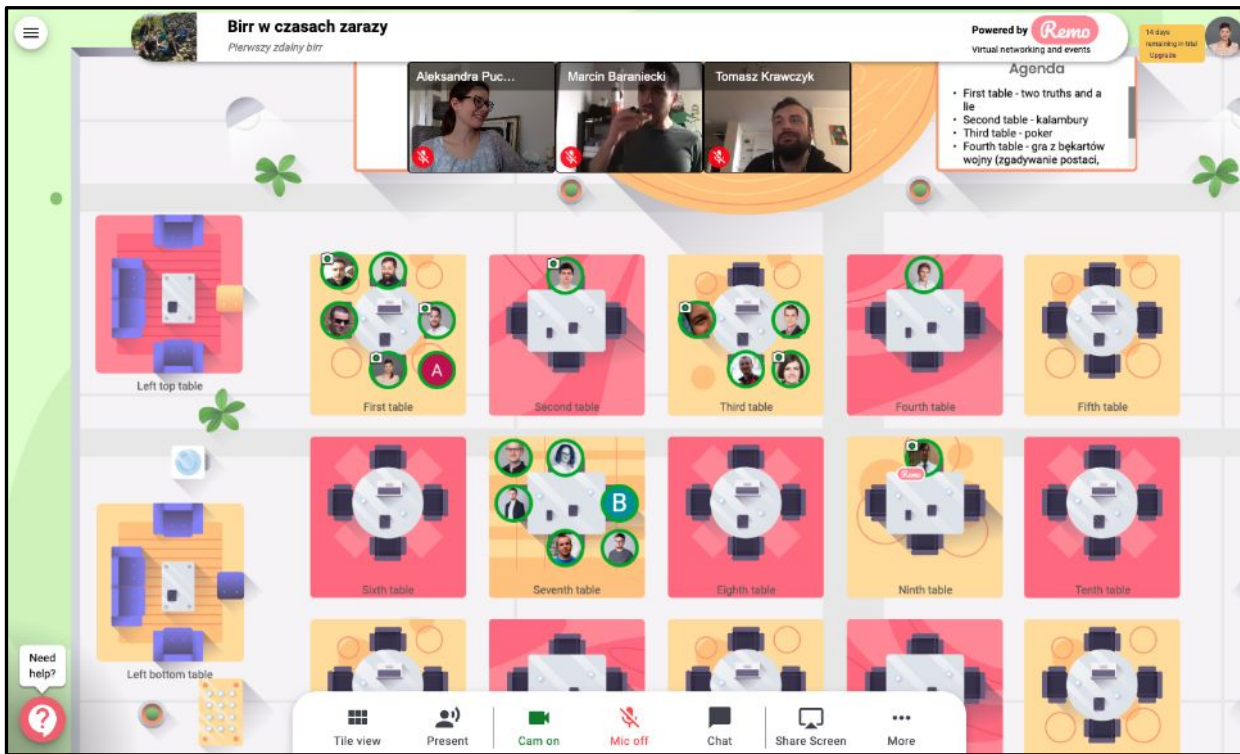
US “Maximum Telework” Posture



Remote Meetings and Interaction

(Remo)

(Gamerjibe)



XR + MeetinVR



Human Factors and Training Always Last?



Questions?

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SIMNET M1 tank simulator - 1986