



GCSP

Geneva Centre for Security Policy
Where knowledge meets experience

Géopolitique et implications sécuritaires des technologies émergentes

Dr. Jean-Marc Rickli

Directeur des risques globaux et émergents

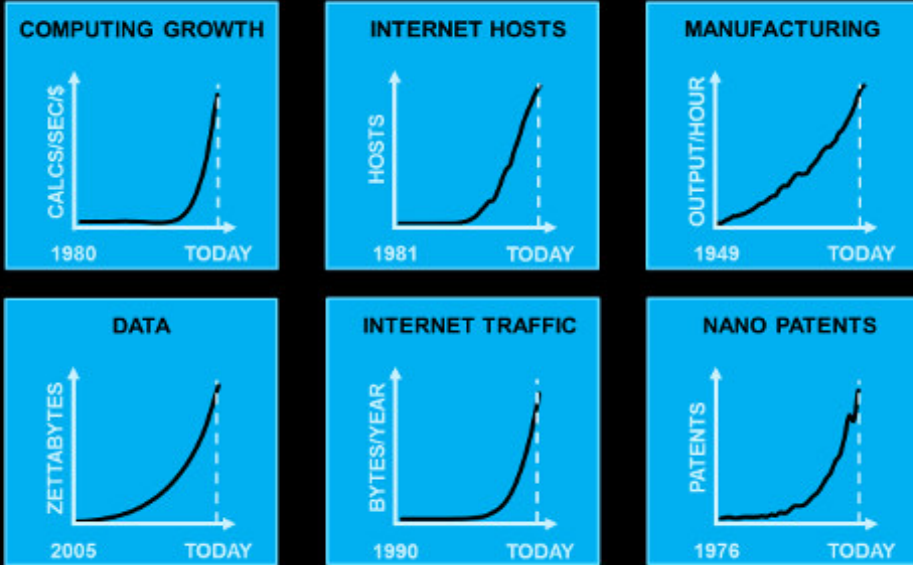
28 février 2022

1. Exponentialité
2. Surveillance et contrôle social
3. Manipulations
4. Démocratisation et prolifération
5. Evolutivité: guerre en essaims
6. Convergence
7. Guerre par supplétifs
8. Géopolitique de l'espace digital et des technos émergentes

Exponentialité

Exponentialité

THE WORLD'S PACE OF CHANGE IS EXPONENTIAL



How Long Until Computers Have the Same Power As the Human Brain?

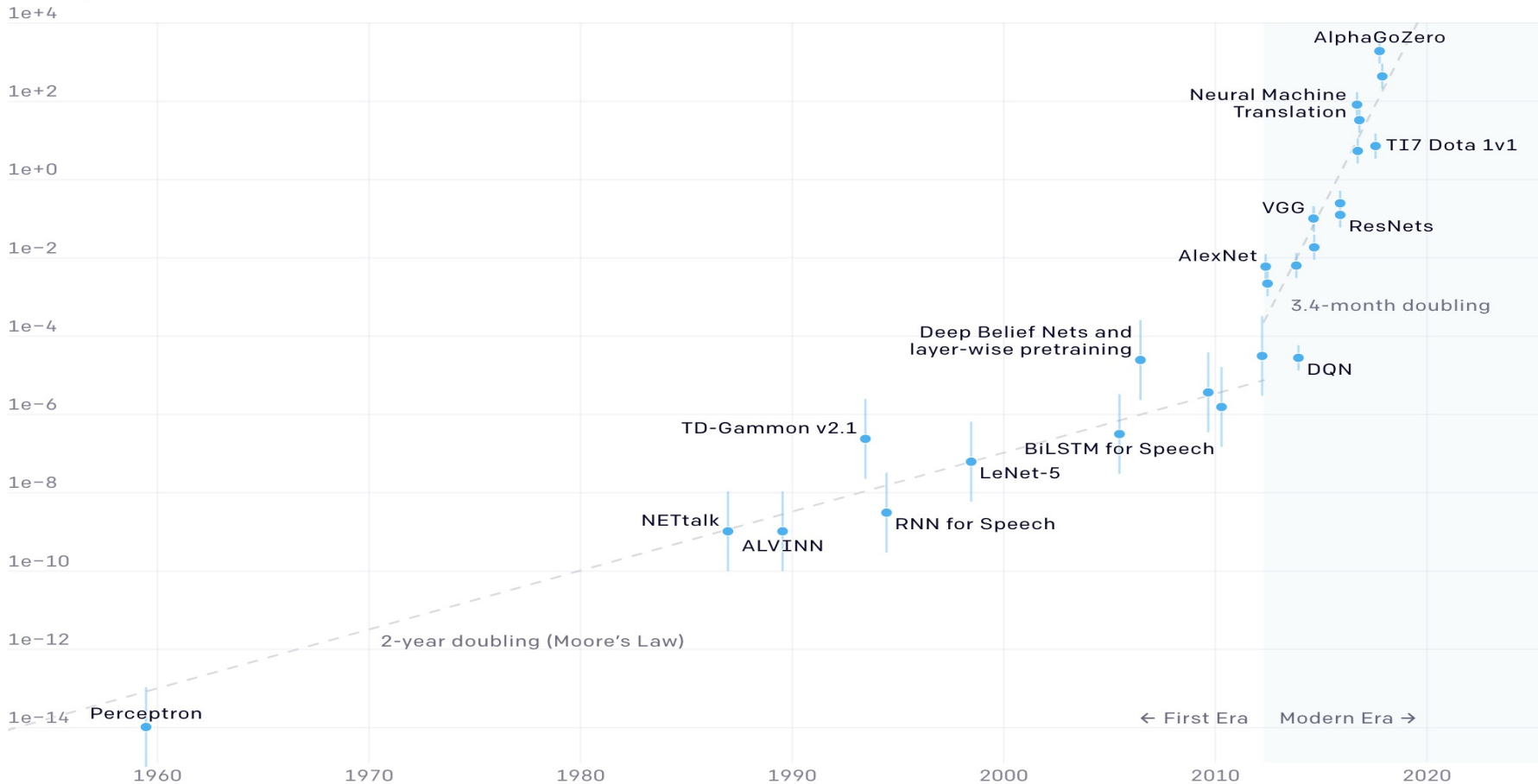
Lake Michigan's volume (in fluid ounces) is about the same as our brain's capacity (in calculations per second). Computing power doubles every 18 months. At that rate, you see very little progress for a long time—and suddenly you're finished.



Data Sources: Singularity.com; Internet Systems Consortium; IDC; Nature Nanotechnology; Amibuster

Two Distinct Eras of Compute Usage in Training AI Systems

Petaflop/s-days

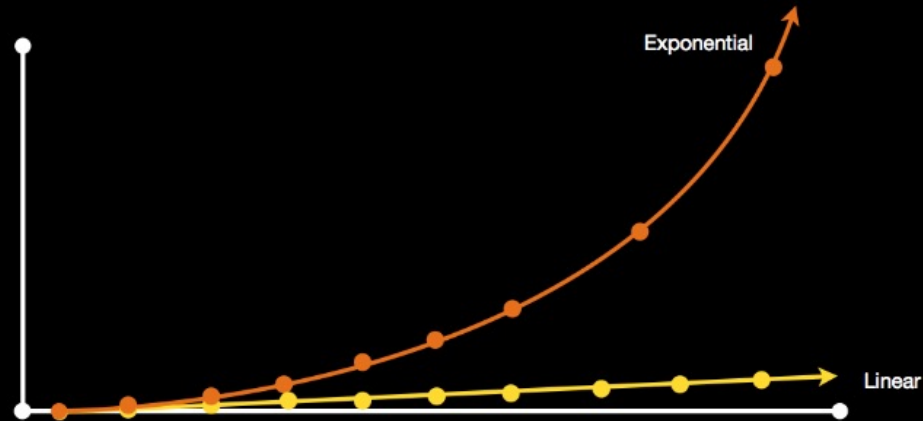


Exponentialité

&

Our blind spot comes from the fact that we have lived in a linear world.

But today's changes are exponential.

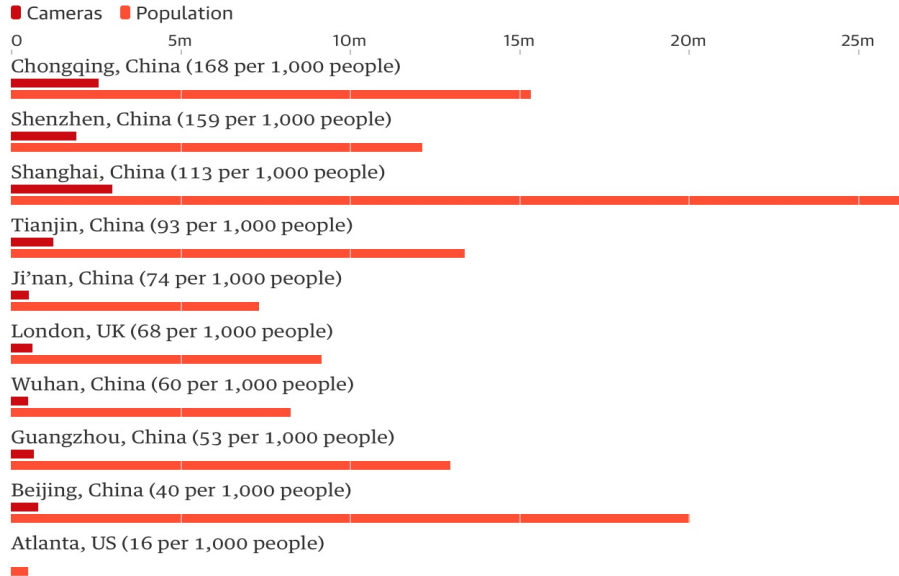


Surveillance

Matthew Keegan **Big Brother is watching: Chinese city with 2.6m cameras is world's most heavily surveilled**

Mon 2 Dec 2019
06.00 GMT

10 cities with most surveillance cameras per person



Guardian graphic | Source: Comparitech



One Month, 500,000 Face Scans: How China Is Using A.I. to Profile a Minority

Examen des photos



Sagara Ranjan Wijedasa (3) a ajouté une photo sur laquelle vous apparaissez peut-être.

Il y a 6 minutes · 🌐



Identifiez-vous

Ignorer

IA et contrôle social

Examen des photos

Examen des photos

Paramètres



Sergiy Korsunsky [1 ami(e) en commun] a ajouté une photo sur laquelle vous apparaissez peut-être.

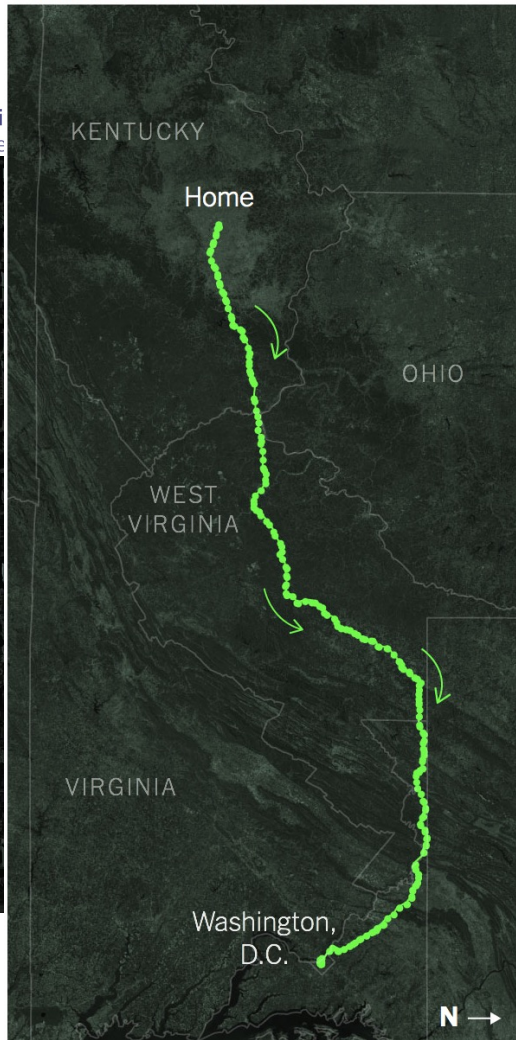
, à 10:38 · 🌐



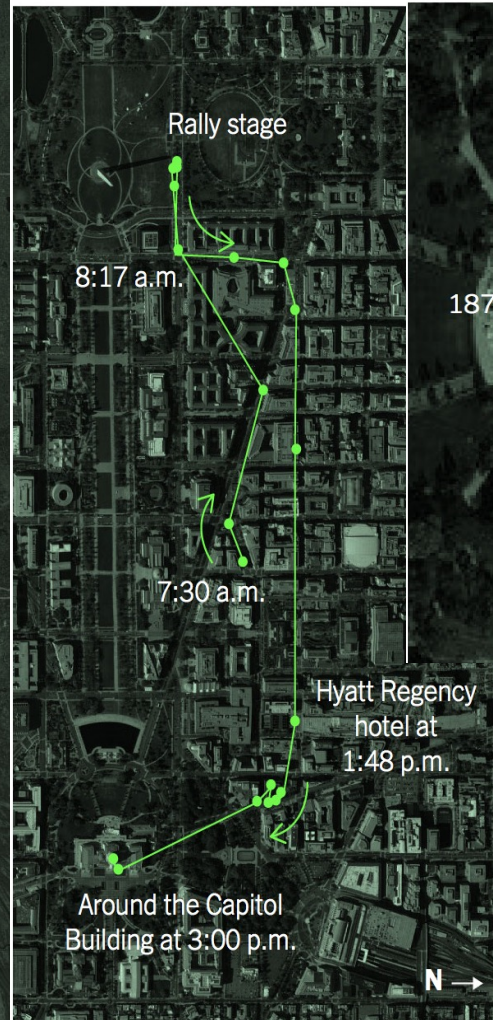
Identifiez-vous

Ignorer

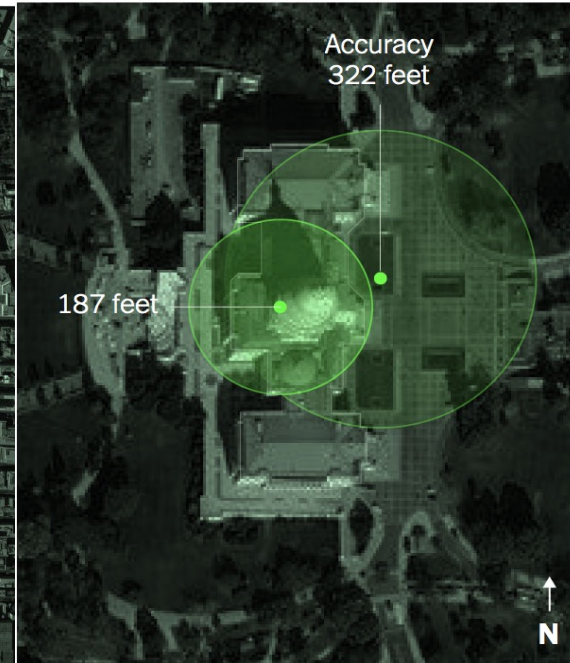
The trip to Washington, D.C.



The day of the protest



At the Capitol



09.26.19

Amazon is injecting Alexa with more artificial intelligence than ever

Amazon is using neural networks and natural language models to improve Alexa's speaking style, give it new voices, and even notice that a user is unhappy with it.



The New York Times
The Secretive
Company That
Might End Privacy
as We Know It



By **Kashmir Hill**

Published Jan. 18, 2020 Updated March 18, 2021

IA et surveillance

Schweizer Polizisten testeten verbotene Gesichtserkennungs-App

Gemäss einer internen Kundenliste der Firma Clearview haben Beamte der Stadtpolizei Zürich und der Kantonspolizei St. Gallen die umstrittene Software genutzt. Zürich will das jetzt untersuchen.



Simone Luchetta

Publiziert: 06.09.2021, 04:51

 54 Kommentare



Why Clearview AI is a threat to us all

The surveillance system offers police unprecedented surveillance power.

February 12th, 2020



Mother opens up about being ‘virtually gang raped’ in metaverse

By [Hannah Frishberg](#)

February 1, 2022 | 3:44pm | Updated



Meta adds ‘Personal Boundary’ to metaverse after ‘virtual gang rape’

By [Theo Wayt](#)

February 4, 2022 | 11:57am | Updated

Manipulations

IA et manipulations



<https://www.thispersondoesnotexist.com>

IA et manipulations



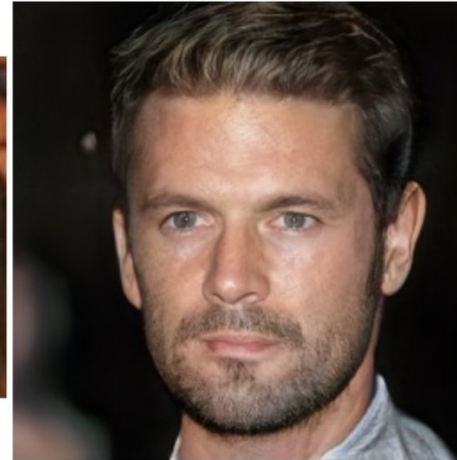
2014



2015



2016



2017



2018

IA et manipulations



STEPSIBLINGS CAUGHT

IA et manipulations



IA et manipulations

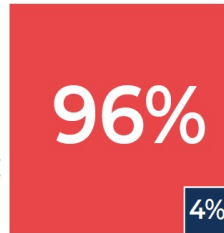
Total number of deepfake videos online

14,678

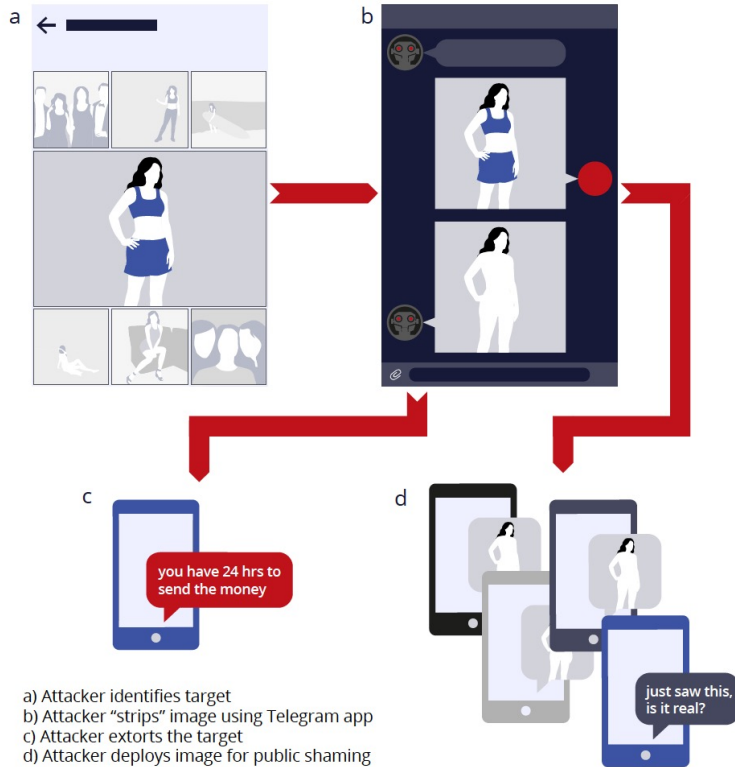
Total number of video views across top four dedicated deepfake pornography websites

134,364,438

percentage of deepfake videos online by
pornographic and
non-pornographic
content



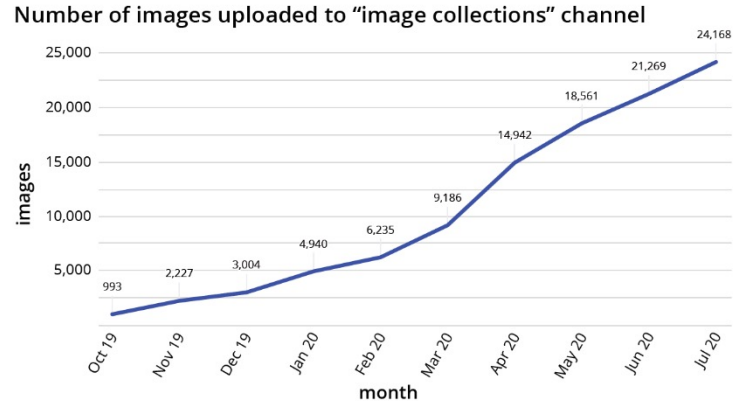
IA et manipulations



Pennsylvania Real-Time News

Pa. woman created ‘deepfake’ videos to force rivals off daughter’s cheerleading squad: police

Updated Mar 17, 2021; Posted Mar 12, 2021



Deepfake Bots on Telegram, Sensity, 2020

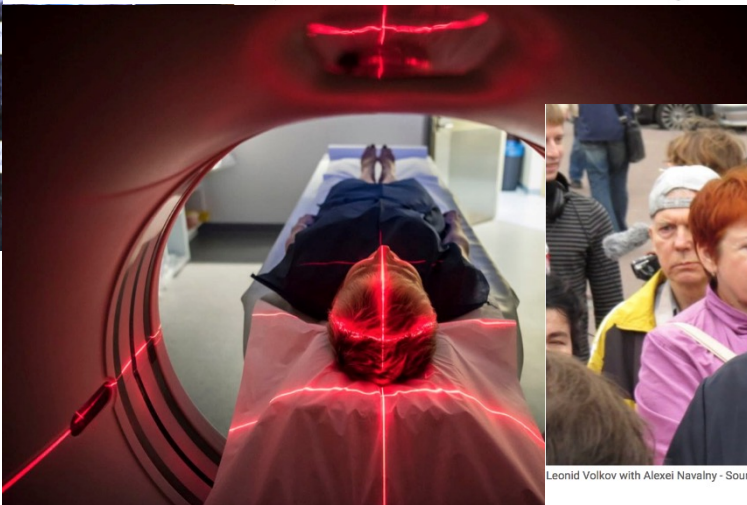
IA et manipulations

The Newest AI-Enabled Weapon: 'Deep-Faking' Photos of the Earth



Defense One, 31 March 2019

Hospital viruses: Fake cancerous nodes in CT scans, created by malware, trick radiologists



Washington Post, 3 April 2019



Leonid Volkov with Alexei Navalny - Source: [putnik at Wikimedia Commons](#)

POLITICS TECH INNOVATION LEONID VOLKOV ALEXEI NAVALNY DEEFAKE
» MORE TAGS

SATURDAY, APRIL 24, 2021 - 09:36

Dutch MPs in video conference with deep fake imitation of Navalny's Chief of Staff



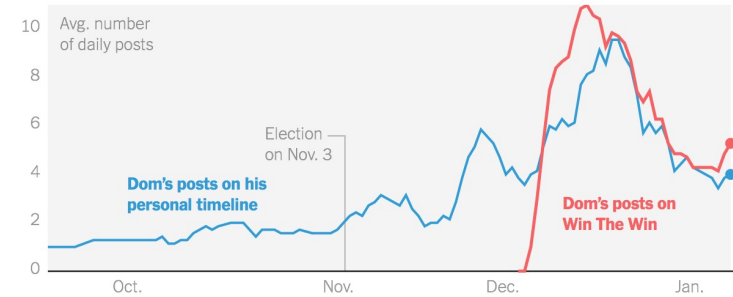
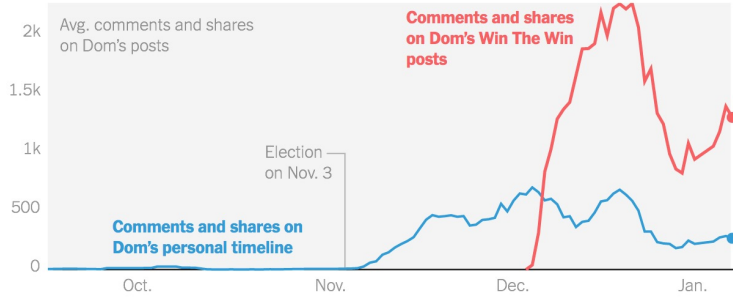
SHARE THIS:

Deepfake: How disinformation fools our brains and damages democracy

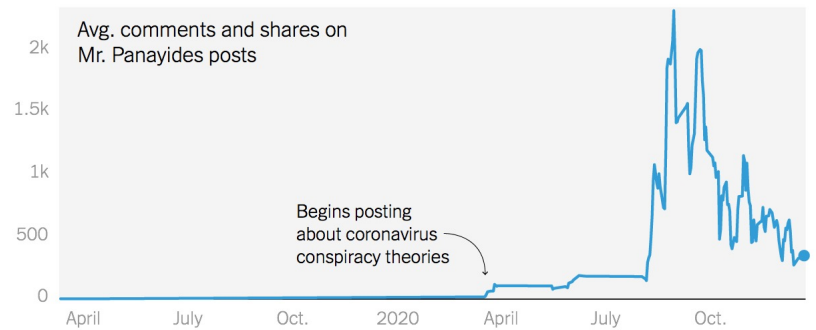
by Gavin Ellis / 20 February, 2019

“Alors que la vérité se propage **rarement au-delà de 100 personnes**, le top 1% des nouvelles reposant sur des mensonges **se propagent entre 1000 et 100'000 personnes**. Il faut **6 fois plus de temps** à la vérité que les mensonges pour atteindre 1500 personnes” 22

IA et manipulations

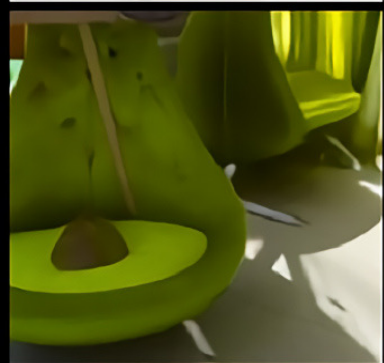


Note: 7-day moving average. • By The New York Times



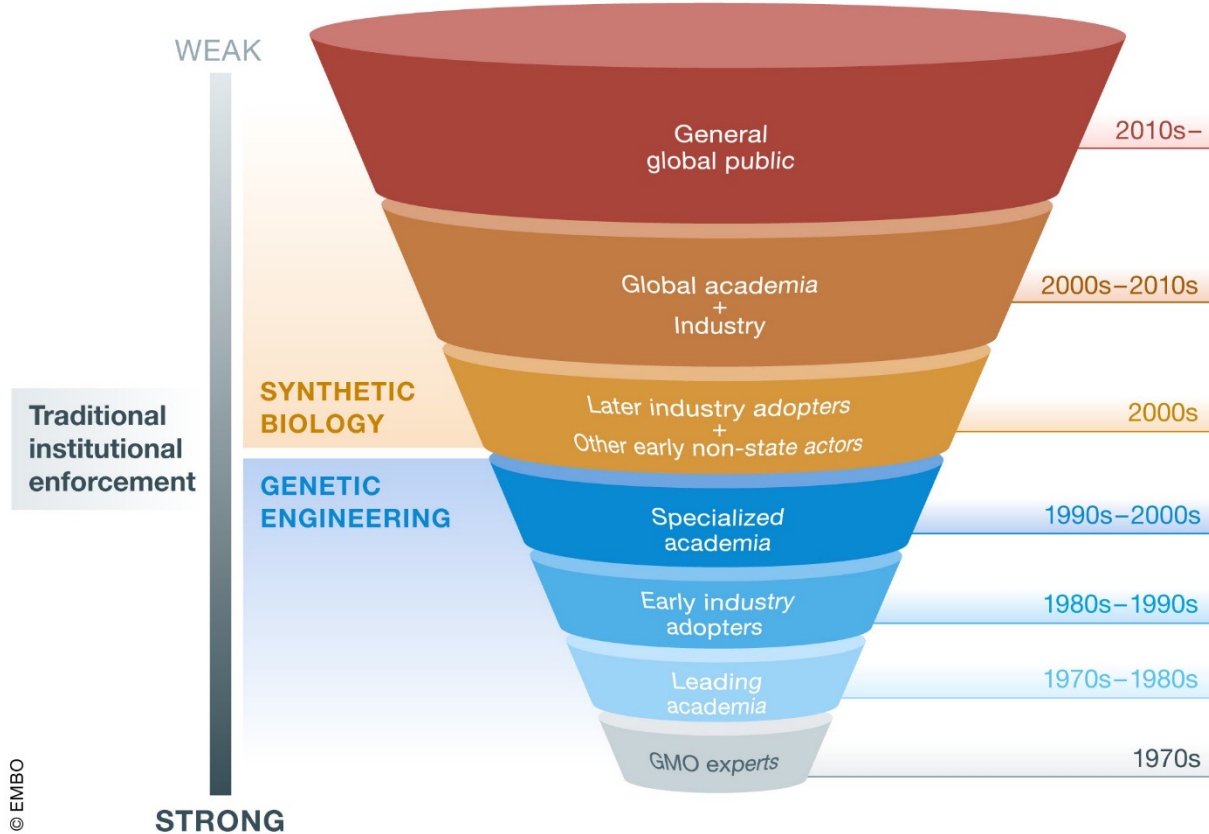
Note: 7-day moving average. • By The New York Times





Démocratisation et rôle stratégique des individus

Démocratisation = prolifération



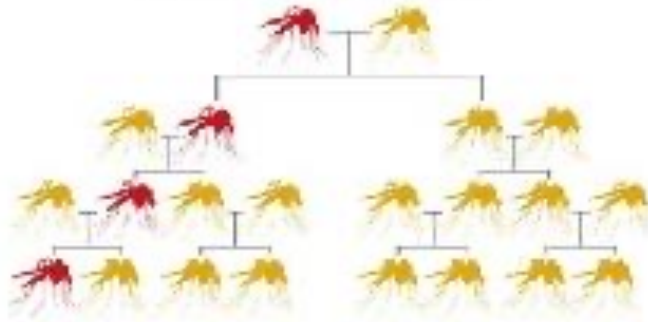
Biohacking



Josiah Zayner, CEO of the biohacking-promoting startup The Odin, held up a syringe. “This will modify my muscle genes to give me bigger muscles,”

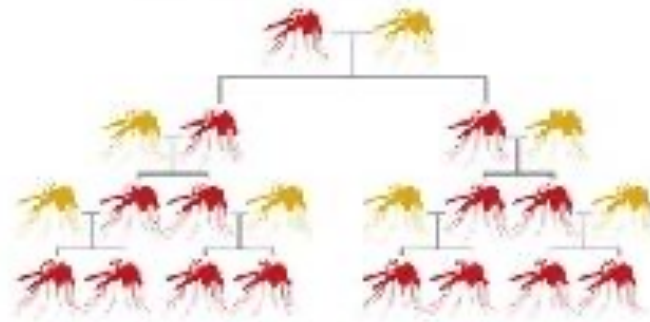
La technologie de l'extinction : le **forçage génétique**

Transmission « normale »
du matériel génétique



Le gène ne se généralise
pas dans la descendance

Transmission **forcée** du
matériel génétique



La généralisation du gène a
été **forcée** dans la descendance

Démocratisation = prolifération



Évolutivité: guerre en essais



 Zack Stentz
@MuseZack

The civilization that invented fireworks taking it to the next level.



Swarming: guerre en essaims

“Systemic pulsing of force and/or fire by dispersed internetted units as to strike the adversary from all directions **simultaneously**” – Arquilla and Rondfeldt, (2000)

“Large numbers of dispersed individuals or small groups **coordinating together** and fighting as a **coherent whole**” – Irwing (2017)

Tactique d’essaims: saturer les défenses de l’adversaire en coordonnant et synchronisant une série d’attaques concentrées et simultanées



**Masse, puissance de feu, vitesse,
concentration des forces**



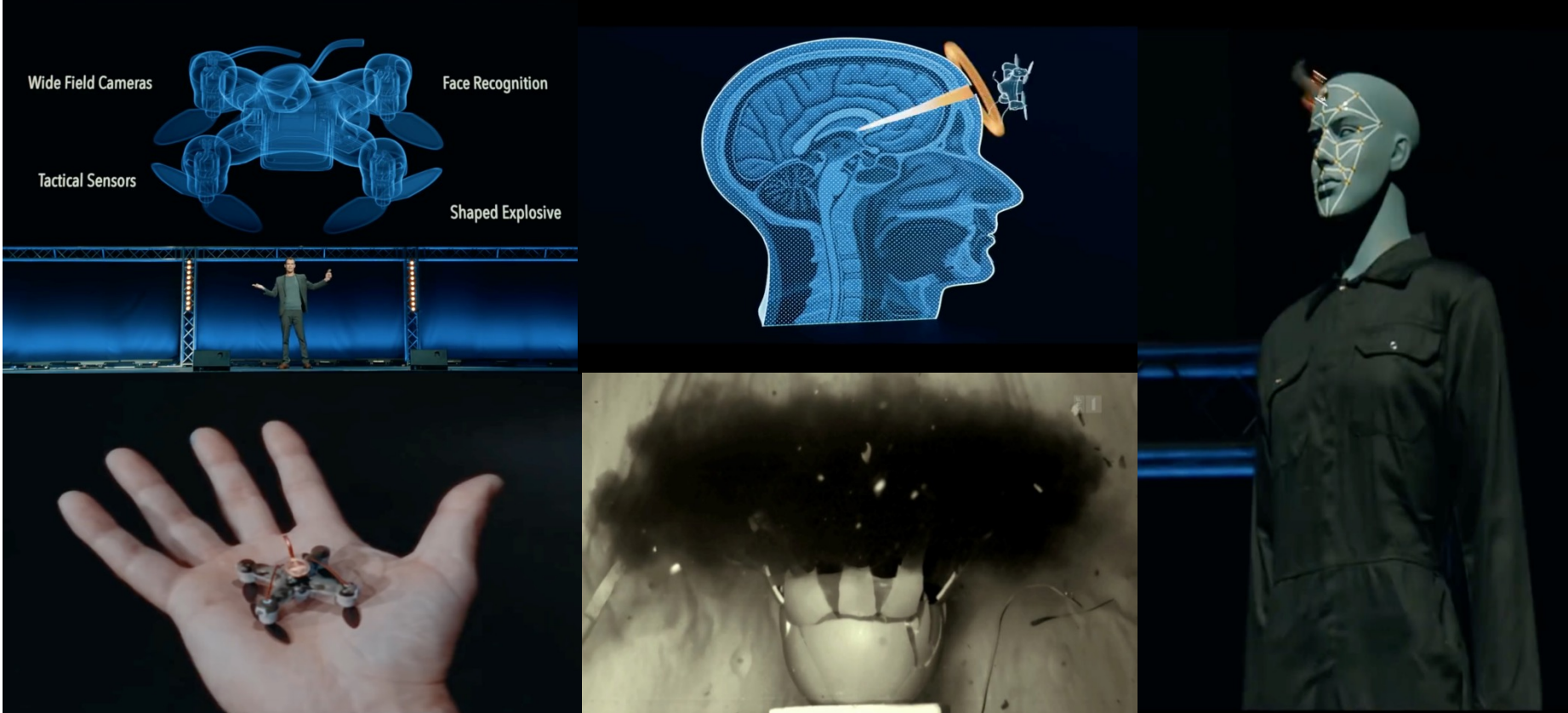
StratoEnergetics LIVE STREAM

<http://www.stratoenergetics.com>

Buenos Aires Event

TV Truck 02

Slaughterbot, a Possible Future?



Drones armés



04-10-2020 08:00:00

T.ME/SHEDEVIRPLUS

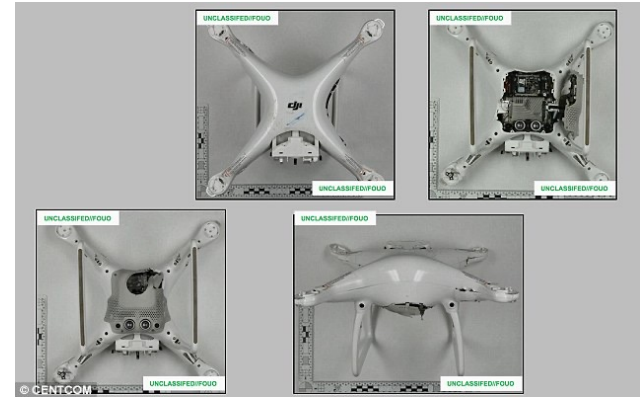


Drones et acteurs non-étatiques

“The threat is really changing — this explosion of commercial technology, of super-empowered commercial technology, of each individual technology path on an accelerated schedule,” James Geurts, who leads SOCOM’s acquisitions, technology and logistics efforts, said on 16 May 2017. “When you start stacking accelerations on top of each other, **pretty soon you’ve got autonomous swarms of drones** with facial recognition attacking you on the battlefield. And so how do you get out in front of that?”

During a recent visit to Mosul, Iraq, SOCOM commander Gen. Ray Thomas said he ran into a pair of operators who had found an off-the-shelf rotary-wing quadcopter adapted by ISIS weaponers to carry a 40 mm weapon.

“This is how adaptive the enemy was,” Thomas said. “About five or six months ago, it was a day that the Iraqi effort almost came to a screeching halt. Literally **in the span of 24 hours, there were up to 70 drones in the air**. At one time, 12 ‘killer bees,’ if you will, right overhead” *Defense News, 18 May 2017*



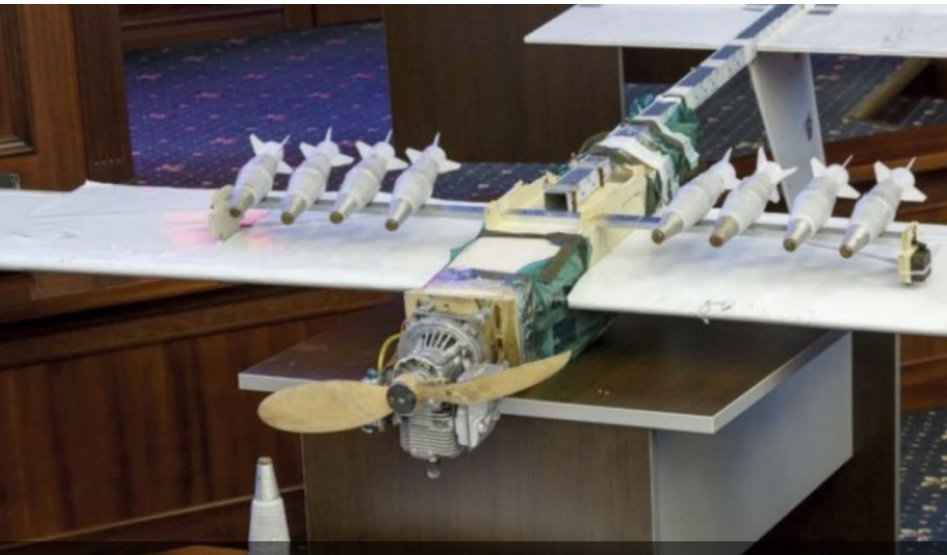
Drones et acteurs non-étatiques



Drones et acteurs non-étatiques

Russia Says Its Syria Bases Beat Back an Attack by 13 Drones

By NEIL MacFARQUHAR JAN. 8, 2018



ENERGY

Saudi stock market dives, crude futures to jump after drone attack on oil plants

PUBLISHED SUN, SEP 15 2019-5:44 AM EDT | UPDATED SUN, SEP 15 2019-8:04 PM EDT



Drones et acteurs non-étatiques

Mexican cartel turns to C4 equipped suicide drones

Josh Spires - Aug. 25th 2020 10:21 am ET @JoshSpires_

Venezuela President Maduro survives 'drone assassination attempt'

© 5 August 2018



Footage showed dozens of soldiers running away before the transmission was cut off



EDITORS' PICK | Apr 22, 2021, 08:05am EDT | 1,769 views

Mexican Cartel Injures Police Officers With Drone Bomb Attack (UPDATE: Second Cartel Allegedly Using Weaponized Drones)



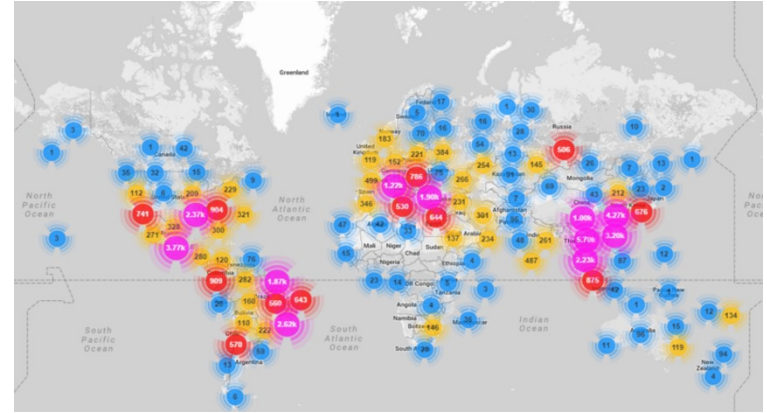
David Hambling Contributor

[Aerospace & Defense](#)

I'm a South London-based technology journalist, consultant and author

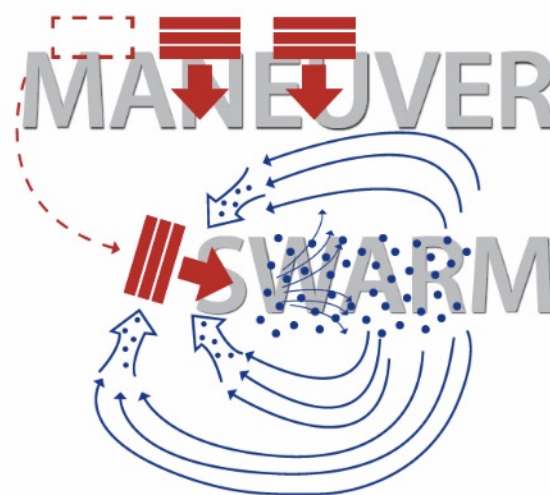
Essaims cybernétiques

- Bot: automated program finding specific vulnerabilities to exploit them
- Botnets or Swarmbot: multiple bots or compromised devices attacking one target at the same time, e.g. Mirai botnet powered by unsecure IoT devices, **IBM DeepLocker**
- Hivenets: clusters of compromised devices with autonomous machine-learning abilities that could automatically both identify and attack other systems. DARPA's cyber challenge



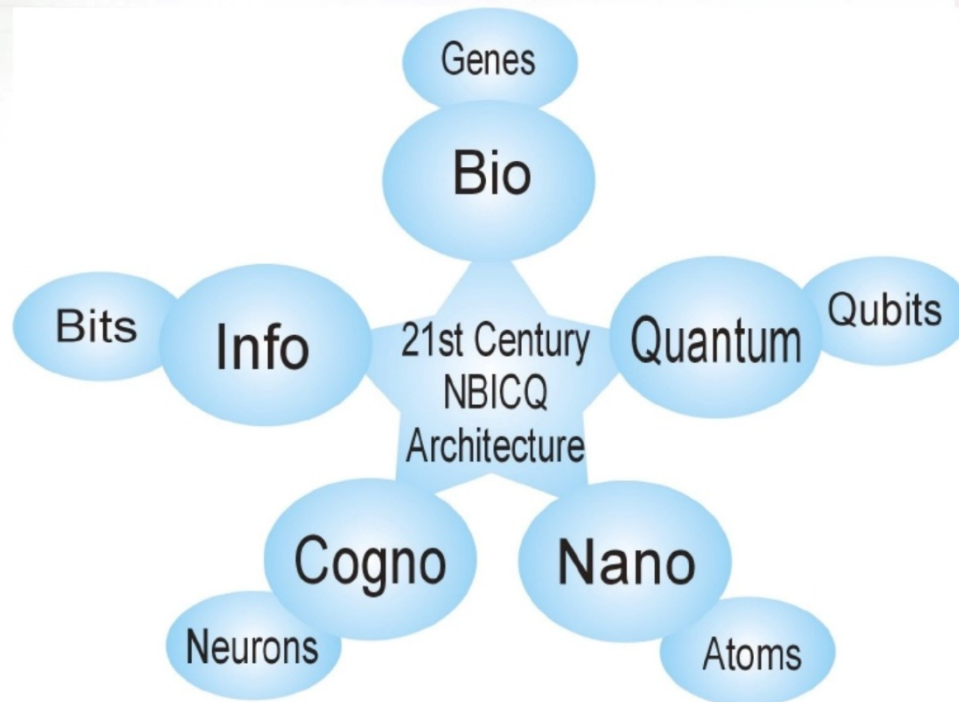
SALA et stabilité stratégique

- Evolutivité du préjudice
- Les super essaims impliquent un haut niveau d'autonomie et une diminution du contrôle humain
- Abaisse le seuil de l'utilisation de la force
- Domination de l'offensive
- Préemption comme norme
- Favorise les courses à l'armement



Convergence

Convergence



Intelligent Machines

Machine learning, meet quantum computing

A quantum version of the building block behind neural networks could be exponentially more powerful.

by Emerging Technology from the arXiv November 16, 2018

October 10, 2019 | *Topic:* Security | *Blog Brand:* The Buzz | *Tags:* Air Force, Military, Technology, F-35, F-15, F-16

The Air Force Is Testing A Secret Weapon: Drone Swarms

Modern warfare will never be the same.

China's Loyal Wingman Drone Flies Alongside Manned Fighters

It's another endorsement for the robotic flying buddy concept.



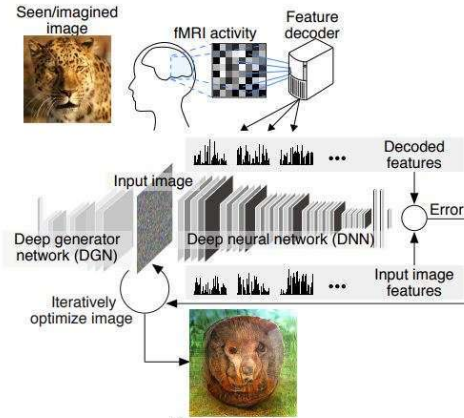
By Kyle Mizokami Aug 31, 2019

October 22, 2019 | *Topic:* Technology | *Region:* Europe | *Blog Brand:* The Buzz | *Tags:* Su-57, Military, Technology, World, Drones, Stealth

Russia's New Stealth Fighters and Drones Are Coming



Neurotechnologies



It's Now Possible To Telepathically Communicate with a Drone Swarm

DARPA's new research in brain-computer interfaces is allowing a pilot to control multiple simulated aircraft at once.



Brain-computer interfaces are developing faster than the policy debate around them

It's time to talk about what's possible — and what shouldn't be

By [Casey Newton](#) | [@CaseyNewton](#) | Jul 31, 2019, 6:00am EDT

Facebook to Buy Startup for Controlling Computers With Your Mind

By [Kurt Wagner](#)
September 24, 2019, 1:30 AM GMT+2

Artificial Intelligence Jul 22, 2019

...

Microsoft is investing \$1 billion in OpenAI to create brain-like machines

Huami Establishes a Brain-computer Interface Joint Lab with Top Chinese University

English ▾

NEWS PROVIDED BY
[Huami](#) →
May 27, 2020, 23:54 ET

Elon Musk unveils updated Neuralink brain implant design and surgical robot



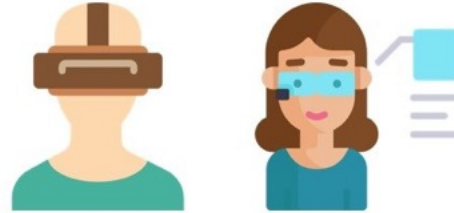
Natashah Hitti | 2 September 2020 | 12 comments

N.0 Realities

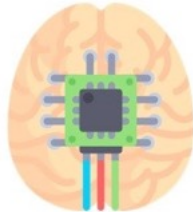
2. Digital Reality 1.0



3. Digital Reality 2.0



4. Brain Computer Interface



5. Whole Brain Emulation



CO20208 | AI Governance and Military Affairs – Neurotechnologies and Future Warfare

Jean-Marc Rickli

07 December 2020



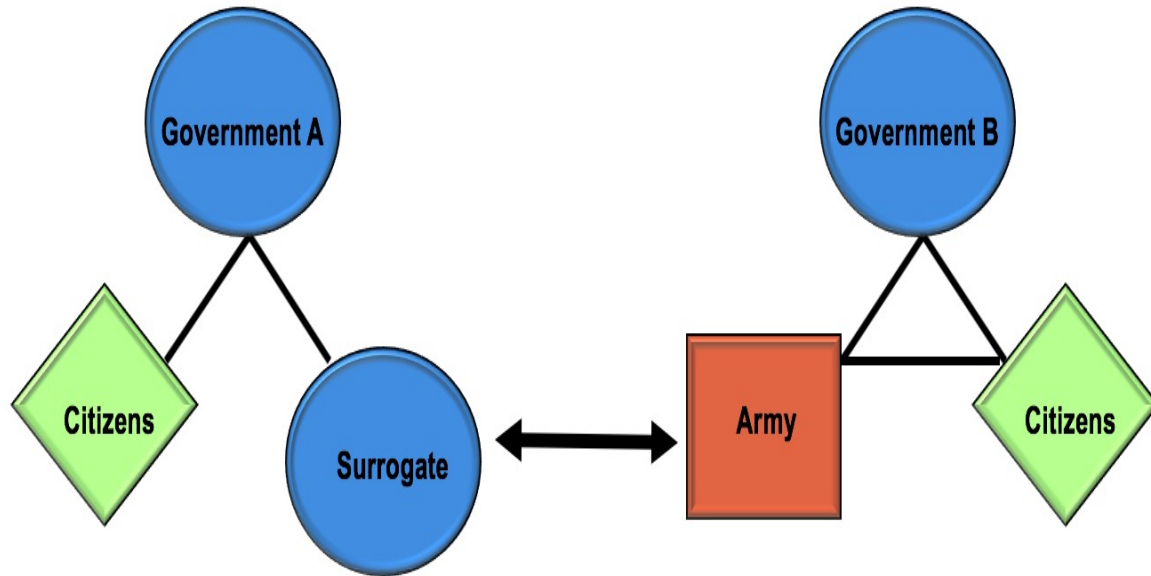
 [DOWNLOAD PDF](#)

Supplétifs

SURROGATE WARFARE

THE TRANSFORMATION OF WAR
IN THE TWENTY-FIRST CENTURY

ANDREAS KRIEG & JEAN-MARC RICKLI



Drones may have attacked humans fully autonomously for the first time



TECHNOLOGY 27 May 2021

By [David Hambling](#)



AEROSPACE & DEFENSE

Turkish defense company says drone unable to go rogue in Libya

STM chief rebuts 'fire, forget and find' capability cited in UN report

SINAN TAVSAN, Nikkei staff writer

June 20, 2021 22:42 JST

Géopolitique de l'espace digital et des technologies émergentes

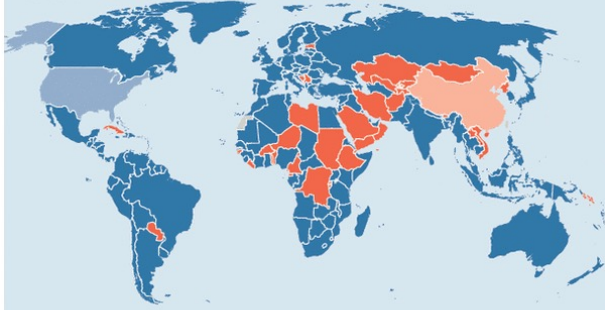
Géopolitique de l'IA

Who you gonna call?

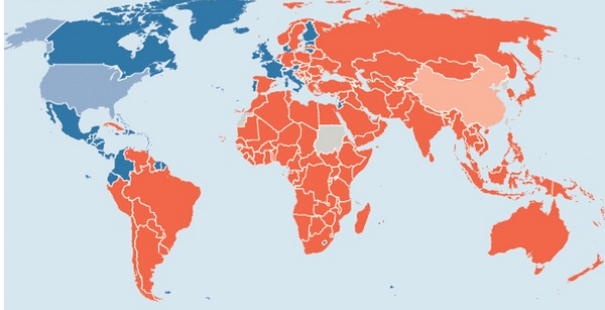
Countries which share greater trade* with:

■ United States ■ China ■ No data

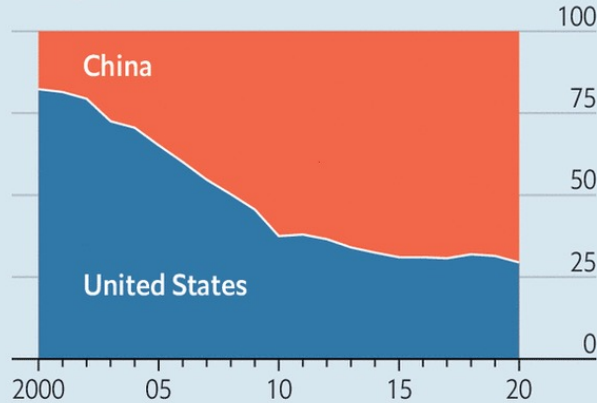
2000†



2020†



% of global total



Source: IMF Direction of Trade Statistics

*Gross merchandise trade, exports plus imports †Or nearest available

The Economist

A more hostile environment

United States, Chinese companies added to sanctions list, by year

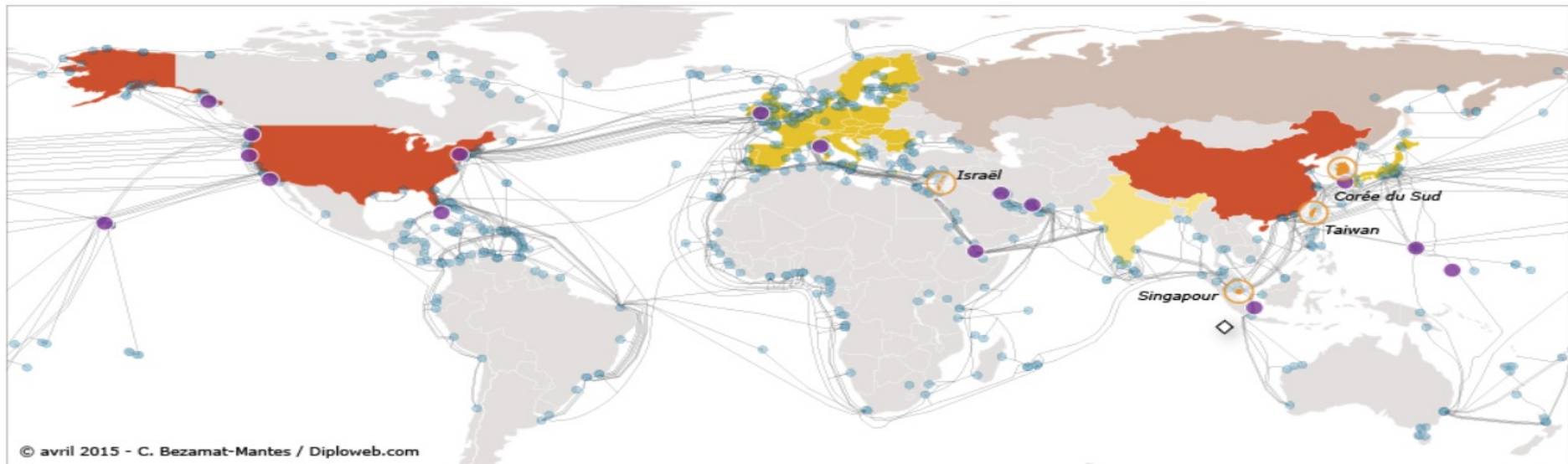


Sources: Department of Commerce; Customs and Borders Protection; Gavekal Dragonomics

*To June 30th

The Economist

Géopolitique de l'Internet



© avril 2015 - C. Bezamat-Mantes / Diploweb.com

I. Des acteurs inégaux ...

- Les cyber-puissances : Etats-Unis et Chine
- 4 cyber-dragons : Israël, Singapour, Taiwan, Corée du Sud
- Les déserteurs du cyber-espace : Union européenne et Japon
- Un acteur secondaire : l'Inde
- Un quasi-absent : la Russie (sauf pour les virus, antivirus et attaques cyber)

II. ... et de remarquables moyens de renseignement

- Câbles sous-marins
- Points d'entrée des câbles (stations d'atterrissage)
- Points d'accès majeurs de la NSA aux stations d'atterrissage des câbles
- Sous-marin américain capable de faire des branchements secrets sur les câbles immergés

Géopolitique de l'Internet

...Today's Top 20 Worldwide Internet Leaders Today =
USA @ 11...China @ 9

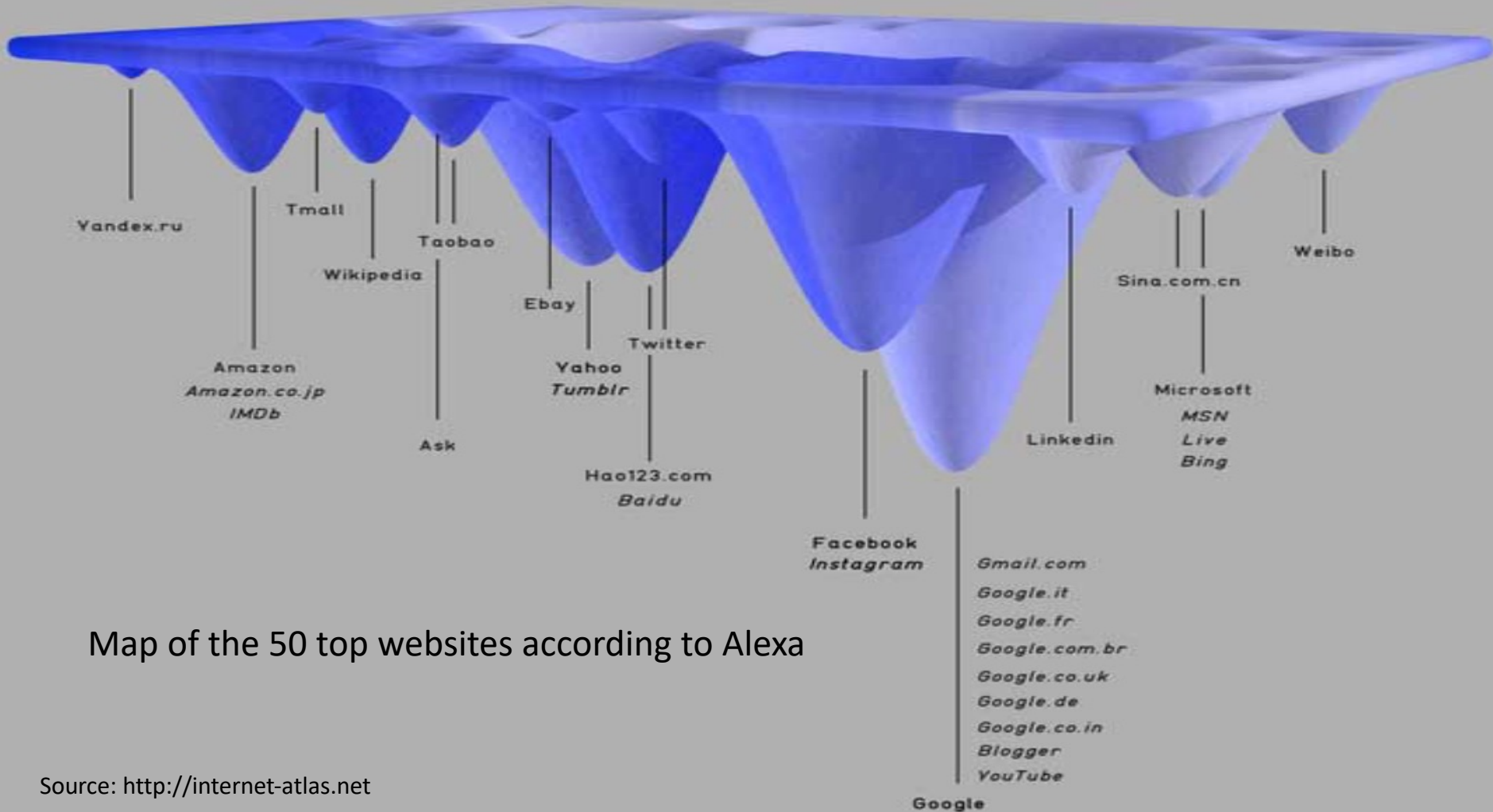
US TECH GIANTS

ASIA TECH GIANTS



Public / Private Internet Companies, Ranked by Market Valuation (5/29/18)

Rank	Company	Region	Market Value (\$B)	
			5/29/13	5/29/18
1)	Apple	USA	\$418	\$924
2)	Amazon	USA	121	783
3)	Microsoft	USA	291	753
4)	Google / Alphabet	USA	288	739
5)	Facebook	USA	56	538
6)	Alibaba	China	--	509
7)	Tencent	China	71	483
8)	Netflix	USA	13	152
9)	Ant Financial	China	--	150
10)	eBay + PayPal*	USA	71	133
11)	Booking Holdings	USA	41	100
12)	Salesforce.com	USA	25	94
13)	Baidu	China	34	84
14)	Xiaomi	China	--	75
15)	Uber	USA	--	72
16)	Didi Chuxing	China	--	56
17)	JD.com	China	--	52
18)	Airbnb	USA	--	31
19)	Meituan-Dianping	China	--	30
20)	Toutiao	China	--	30
Total			\$1,429	\$5,788



Map of the 50 top websites according to Alexa

Source: <http://internet-atlas.net>

Géopolitique des technologies émergentes

2000 · 2001 · 2002 · 2003 · 2004 · 2005 · 2006 · 2007 · 2008 · ;

· 2009 · 2010 · 2011 · 2012 · 2013 · 2014 · 2015 · 2016 · 2017



AI



Quantum computing



Regenerative medicine



Autonomous driving



Blockchain



Cybersecurity



Virtual reality



Lithium-ion batteries



Drones



Conductive polymers



AI



Quantum computing



Regenerative medicine



Autonomous driving



Blockchain



Cybersecurity



Virtual reality



Lithium-ion batteries



Drones



Conductive polymers

THE GEOSTRATEGY OF ARTIFICIAL INTELLIGENCE

	U.S.A	E.U.	China
MARKET SITUATION FOR MAJOR AI SYSTEM INTEGRATION	OLIGOPOLY		OLIGOPOLY
CONTROL OF PERSONAL DATA	CORPORATE	INDIVIDUALS BASED ON GDPR	GOVERNMENT CONTROLS PEOPLE THROUGH SCORING
REGULATION	SELF REGULATION ETHICS CODES	PARLIAMENTARY LAW BASED ON ETHICS AND FUNDAMENTAL VALUES	GOVERNMENT

Source: Paul Nemitz

Découplage technologique

Les dirigeants **de l'OTAN** se sont réunis le 14 juin 2021 à Bruxelles, à l'occasion de leur sommet annuel. Ils ont discuté d'un **large éventail de questions**, notamment des principaux thèmes de l'initiative OTAN 2030 : comment renforcer l'unité de l'Alliance, élargir son approche de la sécurité et contribuer à la sauvegarde de l'ordre international fondé sur des règles.

Parmi les sujets abordés:

- **Chine:** Les «ambitions déclarées et le comportement affirmé de la Chine constituent des **défis systémiques** pour l'ordre international fondé sur des règles». La nouvelle stratégie de l'OTAN exige que les États consacrent davantage de ressources à **la lutte contre l'influence mondiale croissante** de la Chine. En réponse, la Chine a averti l'OTAN qu'elle ne resterait pas les bras croisés face à tout défi. Pékin a répondu qu'elle ne représentait un «défi systémique» pour aucun pays et a ajouté que l'OTAN ne devait pas exagérer la puissance militaire de la Chine.



"We have to recognize that we do not share the same values, political systems, or approach to multilateralism." "We will engage in a clear-eyed and confident way, robustly defending EU interests and standing firm on our values." Charles Michel

Conclusions

- Période de transition géopolitique: polarisation croissante
- Rôle stratégique croissant des individus et acteurs non-étatiques
- Nature exponentielle du développement des technos émergentes
- Prolifération verticale et horizontale très rapide
- Rôle croissant des substituts technologiques pour commettre des actes de violence
- Environnement international plus conflictuel, avantage offensif?
- Besoin urgent d'éduquer les preneurs de décision et la population sur l'impact des technos émergentes
- Convergence technologique: besoin de prospective
- Changement du paradigme sécuritaire: défense à résilience

Merci de votre attention

Questions?

Dr. Jean-Marc Rickli

j.rickli@gcsp.ch

Twitter: [@Dr_JMRickli](https://twitter.com/Dr_JMRickli)