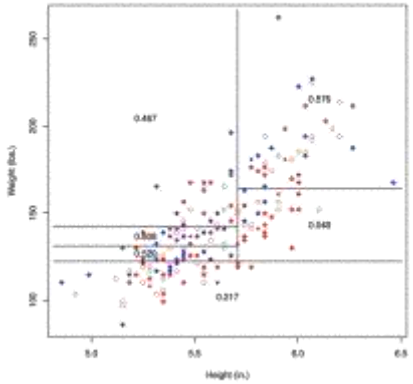


Intelligence artificielle, distribution, uberisation, un pilote sans avion?

christian.lovis@hcuge.ch
sciences de l’information médicale

UNIVERSITÉ DE GENÈVE
FACULTÉ DE MÉDECINE

HUG Hôpitaux Universitaires Genève


MATT DAMON
JODIE FOSTER
ELYSIUM
FROM THE DIRECTOR OF 'DISTRICT 9'
IMAX 08.09.13

Business Report

IBM Aims to Make Medical Expertise a Commodity

Big Blue thinks its *Jeopardy!* champion Watson can make money by offering health-care providers new expertise without hiring new staff.

by Tom Simonite July 21, 2014

THE LANCET

Volume 392 · Number 10142 · Pages 95-186 · July 14-20, 2018 www.thelancet.com

"Continuing to argue for digital exceptionalism and failing to robustly evaluate digital health interventions presents the greatest risk for patients and health systems."

See Editorial page 95

£5.00 Registered as a newspaper · ISSN 0140-6736
Founded 1823 · Published weekly

14 July 2018
Volume 392, Issue 10142

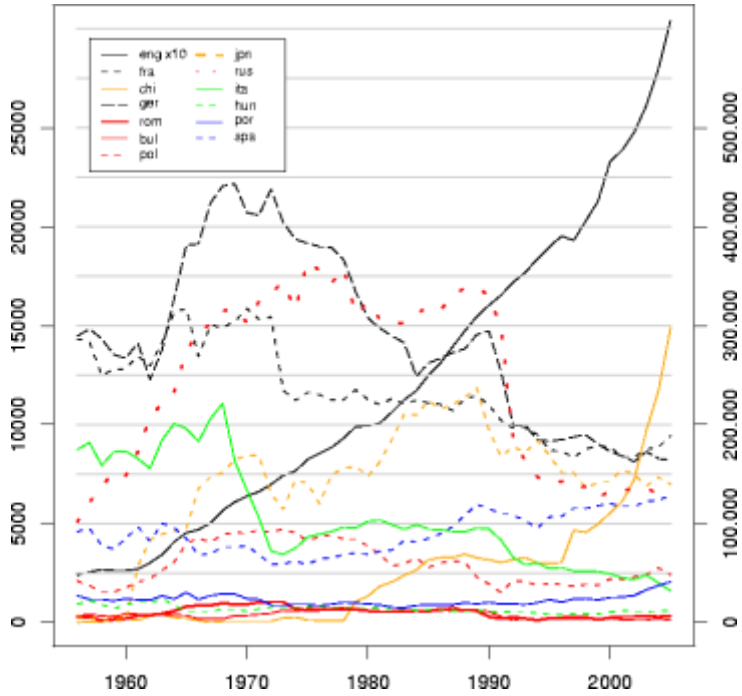
REALITY

UNEMPLOYED

VS.

LinkedIn

Blockchain Enthusiast | Cryptocurrency Evangelist | Influencer | Inspirer | Chief Visionary | Serial Entrepreneur (i.e. every business I started has failed) | Founder (Omission) | Philanthropist (Another Omission) | Empowering (Something) | Life Coach | Father | Trendsetter | Top 1% of LinkedIn Profiles (According to Myself) | Speaker | TEDx (2 x Attendee) | ICO Advisor |



http://dan.corlan.net/medline-trend

PubMed

2016

2’796/day
5’623 journals
86’468 genes

2017

Science AAAS

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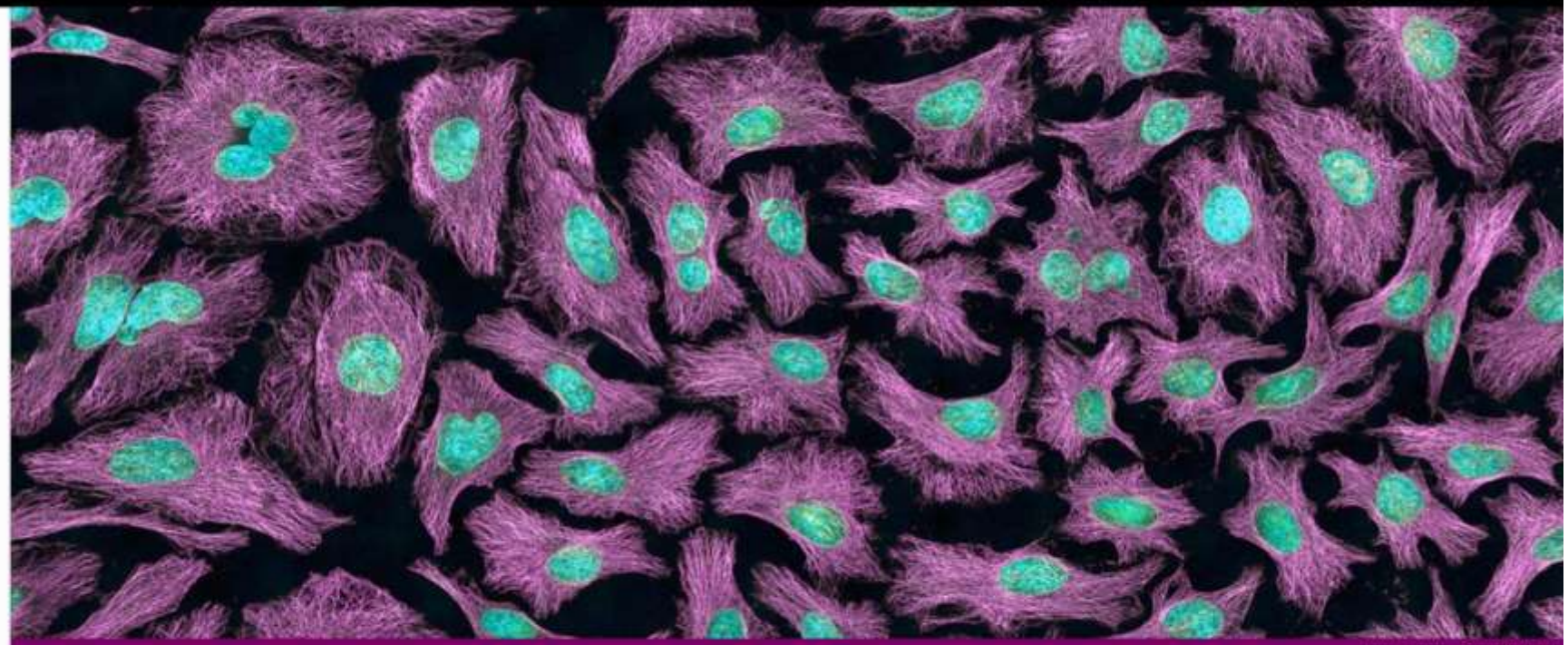
DAVIDE BONAZZI

Rigorous replication effort succeeds for just two of five cancer papers

By Jocelyn Kaiser | Jan. 18, 2017 , 1:00 PM

The first results of a high-profile effort to replicate influential papers in cancer biology are roiling the biomedical community. Of the five studies the project has tackled so far, some involving experimental treatments already in clinical trials, only two could be repeated; one could not, and technical problems stymied the remaining two replication efforts.



HeLa cells. Credit: NIH

Over 30,000 Published Studies Could Be Wrong Due to Contaminated Cells

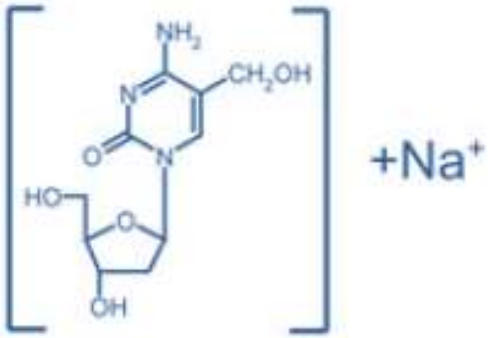
This is very, very bad.

PETER DOCKRILL 16 OCT 2017

Researchers warn that large parts of biomedical science could be invalid due to a cascading history of flawed data in a systemic failure going back decades.

A new investigation reveals more than 30,000 published scientific studies could be compromised by their use of misidentified cell lines, owing to so-called immortal cells contaminating other research cultures in the lab.

The Nuclear DNA Base 5-Hydroxymethylcytosine Is Present in Purkinje Neurons and the Brain



Skirmantas Kriaucionis and Nathaniel Heintz*

Despite the importance of epigenetic regulation in neurological disorders, little is known about neuronal chromatin. Cerebellar Purkinje neurons have large and euchromatic nuclei, whereas granule cell nuclei are small and have a more typical heterochromatin distribution. While comparing the abundance of 5-methylcytosine in Purkinje and granule cell nuclei, we detected the presence of an unusual DNA nucleotide. Using thin-layer chromatography, high-pressure liquid chromatography, and mass spectrometry, we identified the nucleotide as 5-hydroxymethyl-2′-deoxycytidine (hmdC). hmdC constitutes 0.6% of total nucleotides in Purkinje cells, 0.2% in granule cells, and is not present in cancer cell lines. hmdC is a constituent of nuclear DNA that is highly abundant in the brain, suggesting a role in epigenetic control of neuronal function.

we detected the presence of an unusual DNA nucleotide

Science AAAS

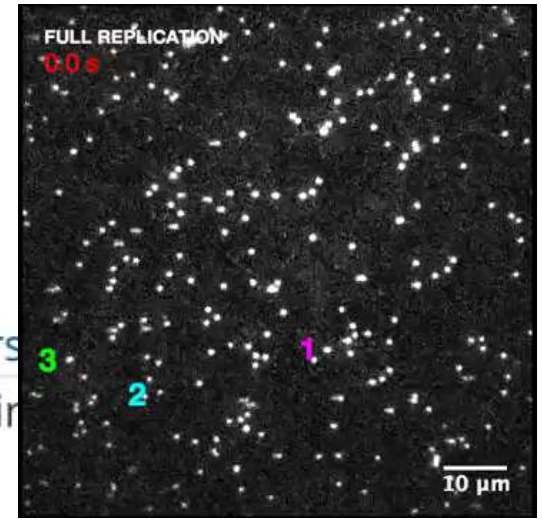
The Nuclear DNA Base 5-Hydroxymethylcytosine Is Present in Purkinje Neurons and the Brain
Skirmantas Kriaucionis and Nathaniel Heintz
Science **324**, 929 (2009);
DOI: 10.1126/science.1169786

PUBLIC RELEASE: 15-JUN-2017

DNA Replication Has Been Filmed For The First Time, And It's Not What We Expected

"It undermines a great deal of what's in the textbooks."

BEC CREW 19 JUN 2017



Here's proof of how far we've come in science - in a world-firs
recorded up-close footage of a single DNA molecule replicatir
questions about how we assumed the process played out.

The real-time footage has revealed that this fundamental part of life incorporates an unexpected amount of 'randomness', and it could force a major rethink into how genetic replication occurs without mutations.

https://www.eurekalert.org/pub_releases/2017-06/uoc--vio061317.phph

The NEW ENGLAND JOURNAL of MEDICINE

Messerli FH.

Chocolate consumption, cognitive function, and Nobel laureates.

N Engl J Med. 2012
Oct 18 367(16):1562-4.

PubMed PMID: 23050509h

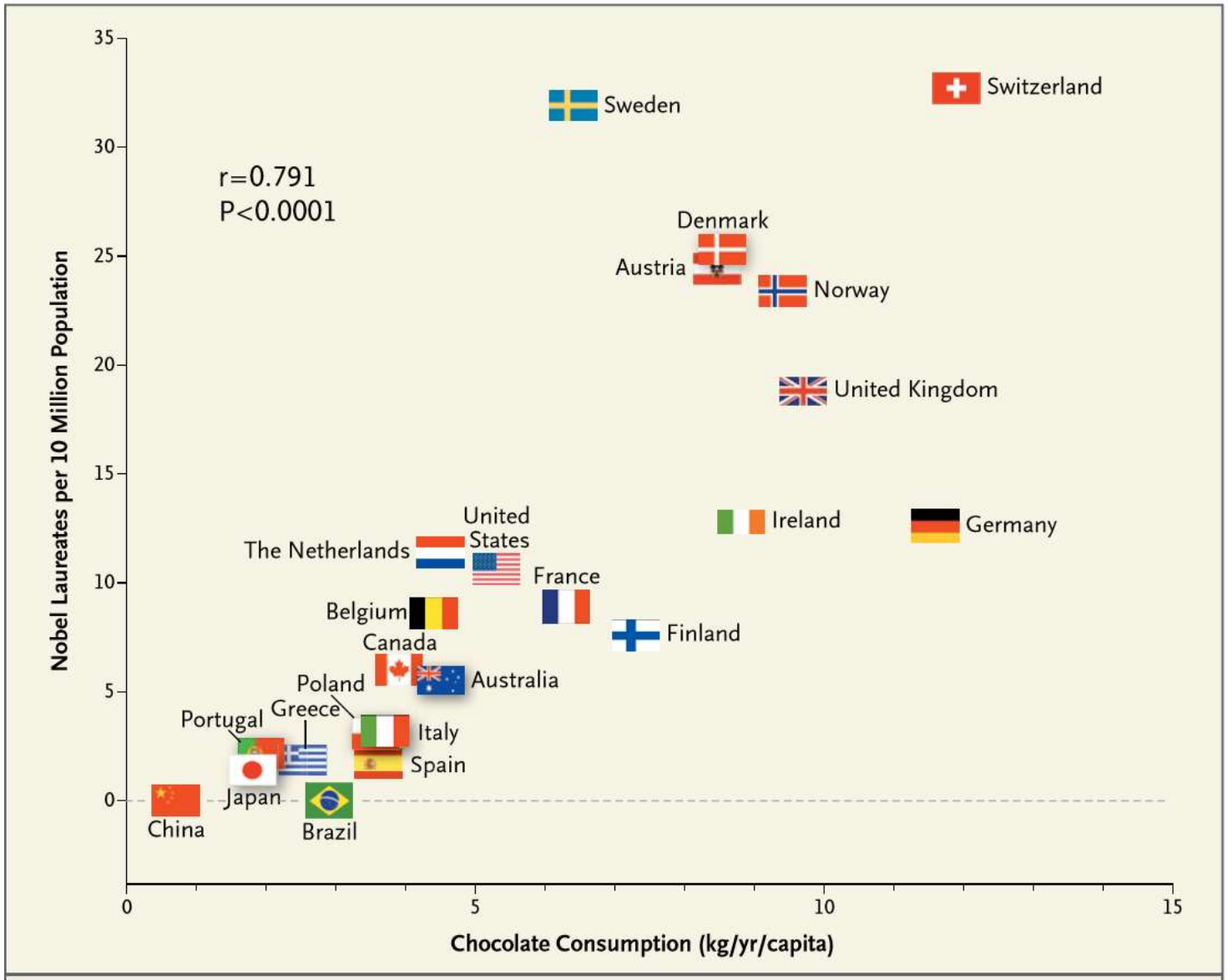


Figure 1. Correlation between Countries' Annual Per Capita Chocolate Consumption and the Number of Nobel Laureates per 10 Million Population.

WIRED Researchers Fooled a Google AI Into Thinking a Rifle Was a Helicopter

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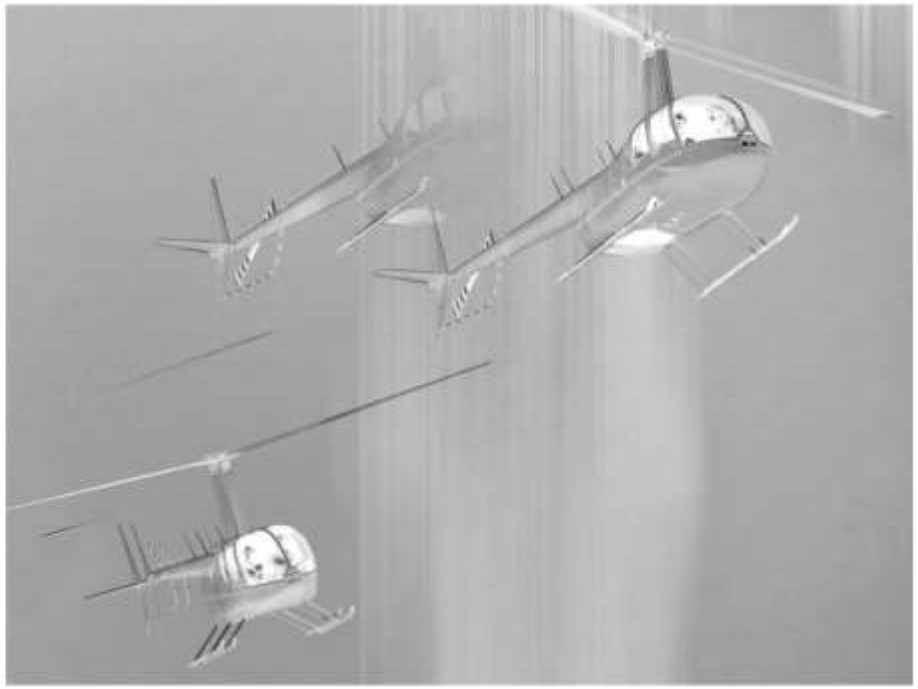
TWEET

COMMENT

EMAIL

LOUISE MATSAKIS SECURITY 12.20.17 12:07 PM

RESEARCHERS FOOLED A GOOGLE AI INTO THINKING A RIFLE WAS A HELICOPTER



https://www.wired.com/story/researcher-fooled-a-google-ai-into-thinking-a-rifle-was-a-helicopter/

[quote]

“in November another team at MIT (with many of the same researchers) published a study demonstrating how Google’s InceptionV3 image classifier could be duped into thinking that a 3-D-printed turtle was a rifle.”

I.A. La faille inattendue

Montrez-lui une orange dont la valeur de quelques pixels a été changée et l'algorithme de reconnaissance visuelle y voit à 99 % un… hélicoptère ! **Vincent Nouyrigat** a enquêté sur un étrange dysfonctionnement de l'I.A. Et les risques qui en découlent…

Ce sont les meilleurs algorithmes du monde. Des machines fantastiques capables de dépasser les capacités humaines de reconnaissance visuelle : ces réseaux de neurones profonds (voir Repères) sont capables d'identifier en un clin d'œil n'importe quel objet, animal, visage humain ou panneau de signalisation… Au point que ces systèmes sont devenus les fers de lance de l'intelligence artificielle, qui promet aujourd'hui de tout révolutionner.

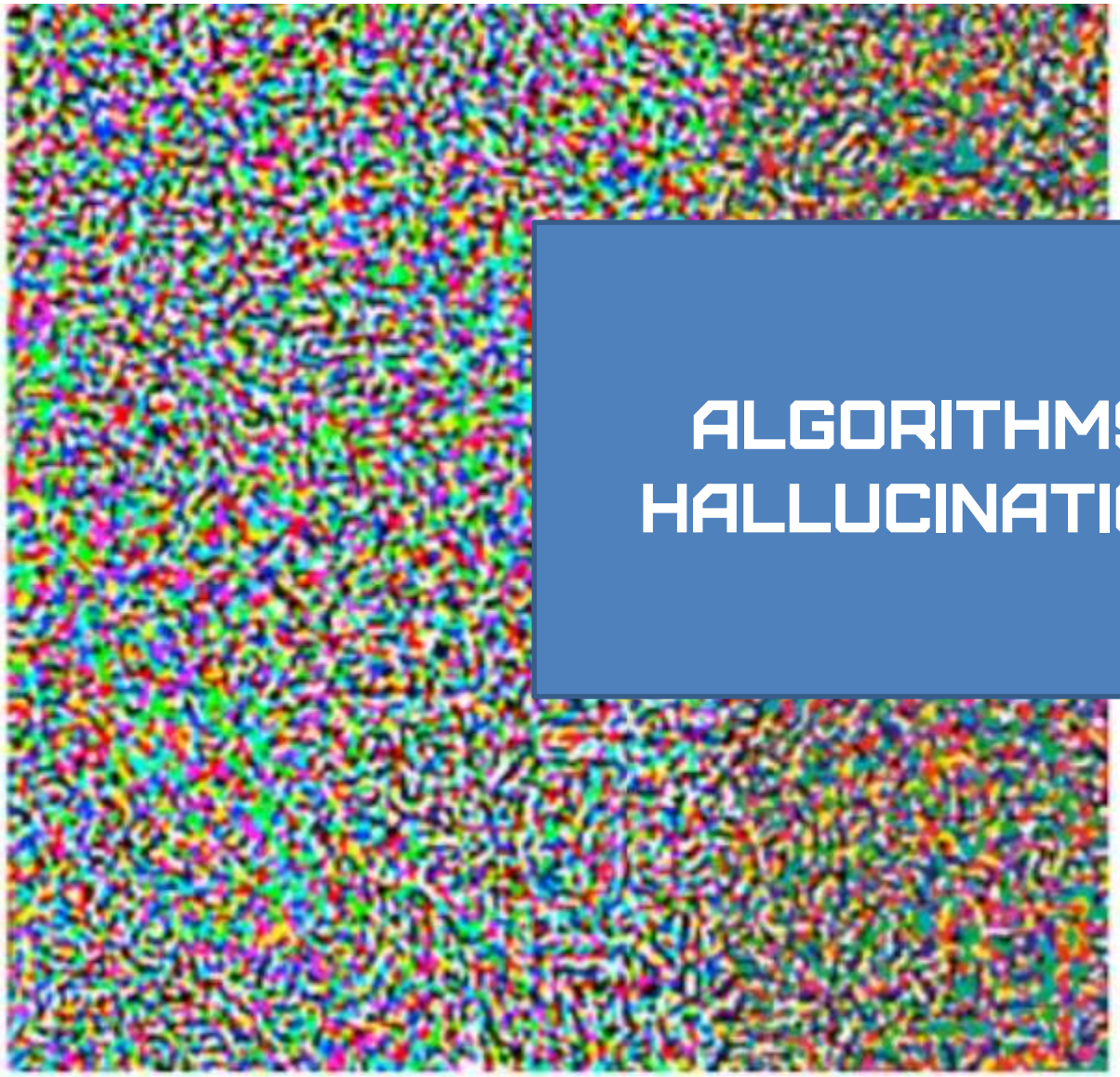
Sauf que ce succès cache une véritable faille. Une vulnérabilité incroyable, que personne n'avait vue venir… Si le problème n'a pas encore filtré dans la presse grand public, il occupe fébrilement des équipes entières de chercheurs depuis environ deux ans. Le problème ? Ces algorithmes formidables sont victimes d'illusions d'optique totalement aberrantes !

Prenez la photo numérique d'un objet. Modifiez subtilement la valeur de quelques-uns de ses pixels… et l'algorithme se met soudain à voir tout autre chose, alors que l'œil humain ne voit aucune différence avec la photo originale. Devant l'image finement manipulée d'un panda, le robot croit ainsi voir un singe – avec un degré de confiance supérieur à 99 %. D'autres en viennent à prendre une tortue pour une mitrailleuse, un skieur pour un chien, un chat pour un bus, George Clooney pour Dustin Hoffman, et pourquoi pas une orange pour un hélicoptère.

Pire : *"à ce jour, personne ne parvient à expliquer ce phénomène"*, avoue Andrew Ilyas, théoricien de l'apprentissage machine au MIT ; il faut dire que les informaticiens peinent encore à comprendre ce qui se trame dans ces espaces de calcul à très haute dimension.

Repères

Les algorithmes fondés sur les réseaux de neurones profonds apprennent à reconnaître, à partir de milliers d'images, les caractéristiques visuelles d'un objet, d'une scène…



ALGORITHMS HALLUCINATION

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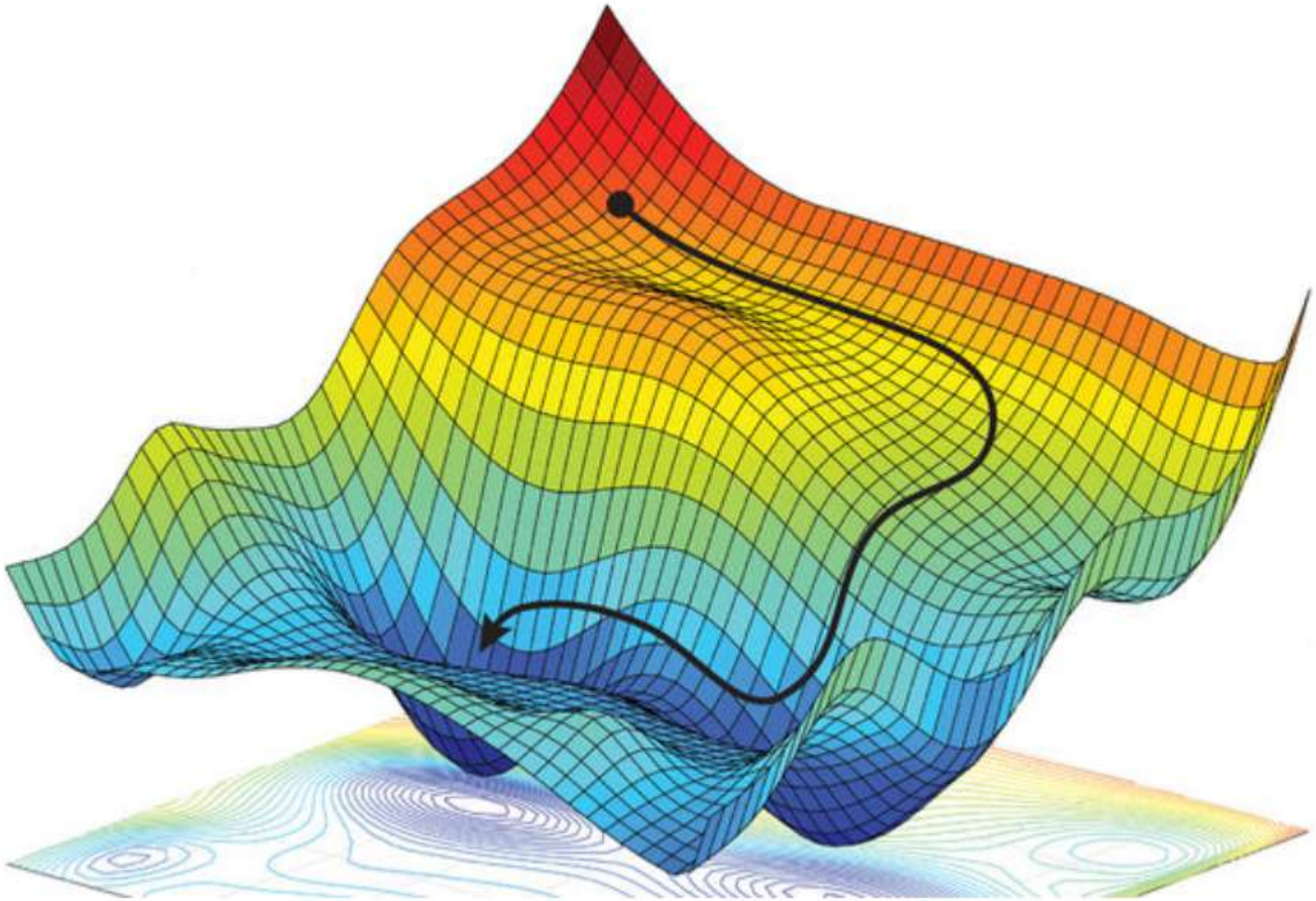


Gradient descent relies on trial and error to optimize an algorithm, aiming for minima in a 3D landscape.
ALEXANDER AMINI, DANIELA RUS. MASSACHUSETTS INSTITUTE OF TECHNOLOGY, ADAPTED BY M. ATAROD/*SCIENCE*

AI researchers allege that machine learning is alchemy

By **Matthew Hutson** | May. 3, 2018 , 11:15 AM

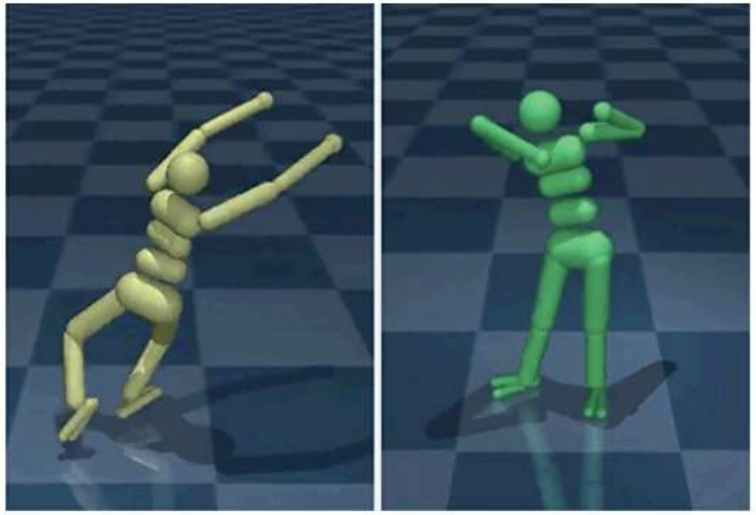
IN DEPTH | COMPUTER SCIENCE

Artificial intelligence faces reproducibility crisis

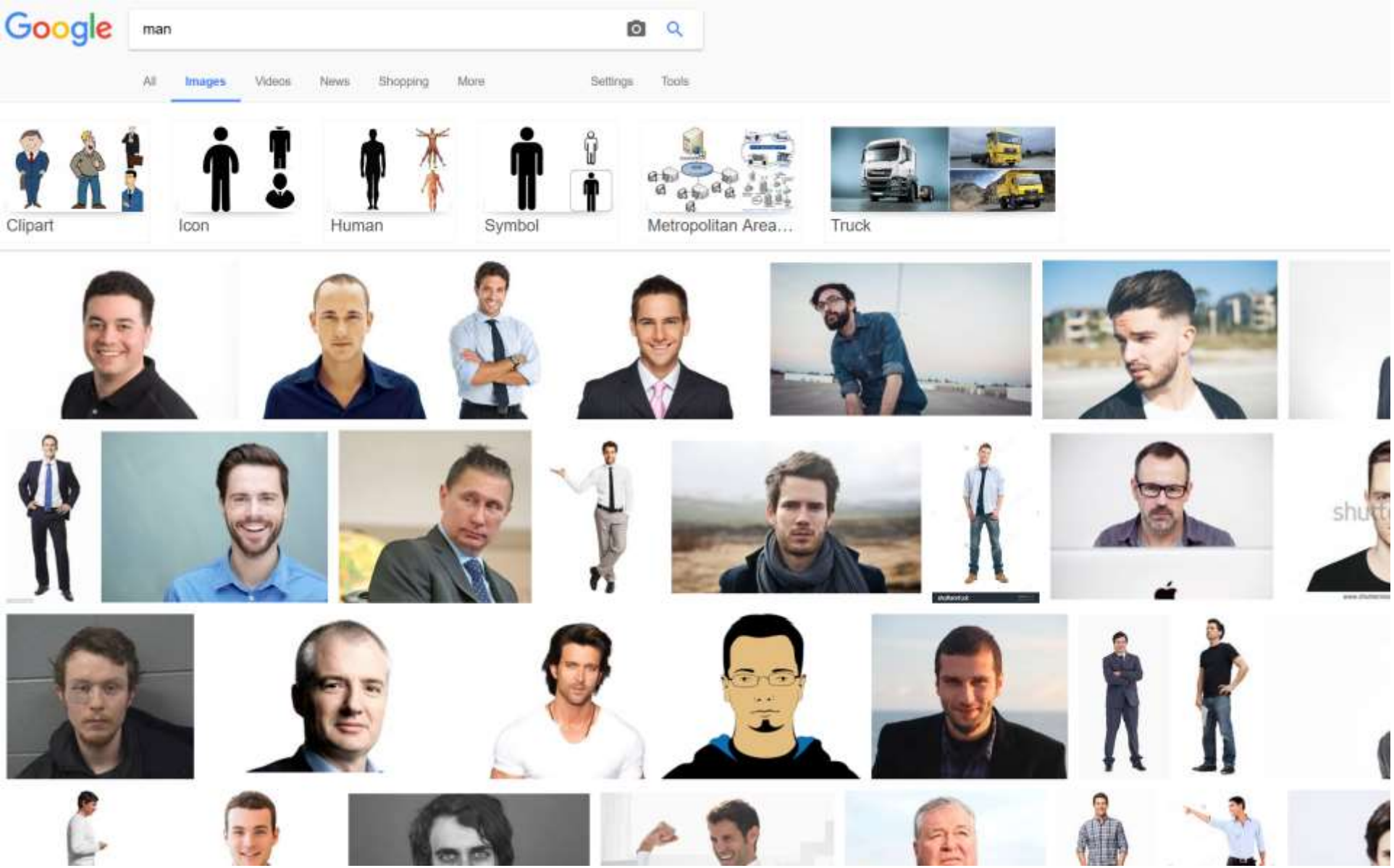
Matthew Hutson
+ See all authors and affiliations

Science 16 Feb 2018:
Vol. 359, Issue 6377, pp. 725-726
DOI: 10.1126/science.359.6377.725

Last year, computer scientists at the University of Montreal (U of M) in Canada were eager to show off a new speech recognition algorithm, and they wanted to compare it to a benchmark, an algorithm from a well-known scientist. The only problem: The benchmark's source code wasn't published. The researchers had to recreate it from the published description. But they couldn't get their version to match the benchmark's claimed performance, says Nan Rosemary Ke, a Ph.D. student in the U of M lab. “We tried for 2 months and we couldn't get anywhere close.”



The same algorithm can learn to walk in wildly different ways. IMAGES: YUVAL TASSA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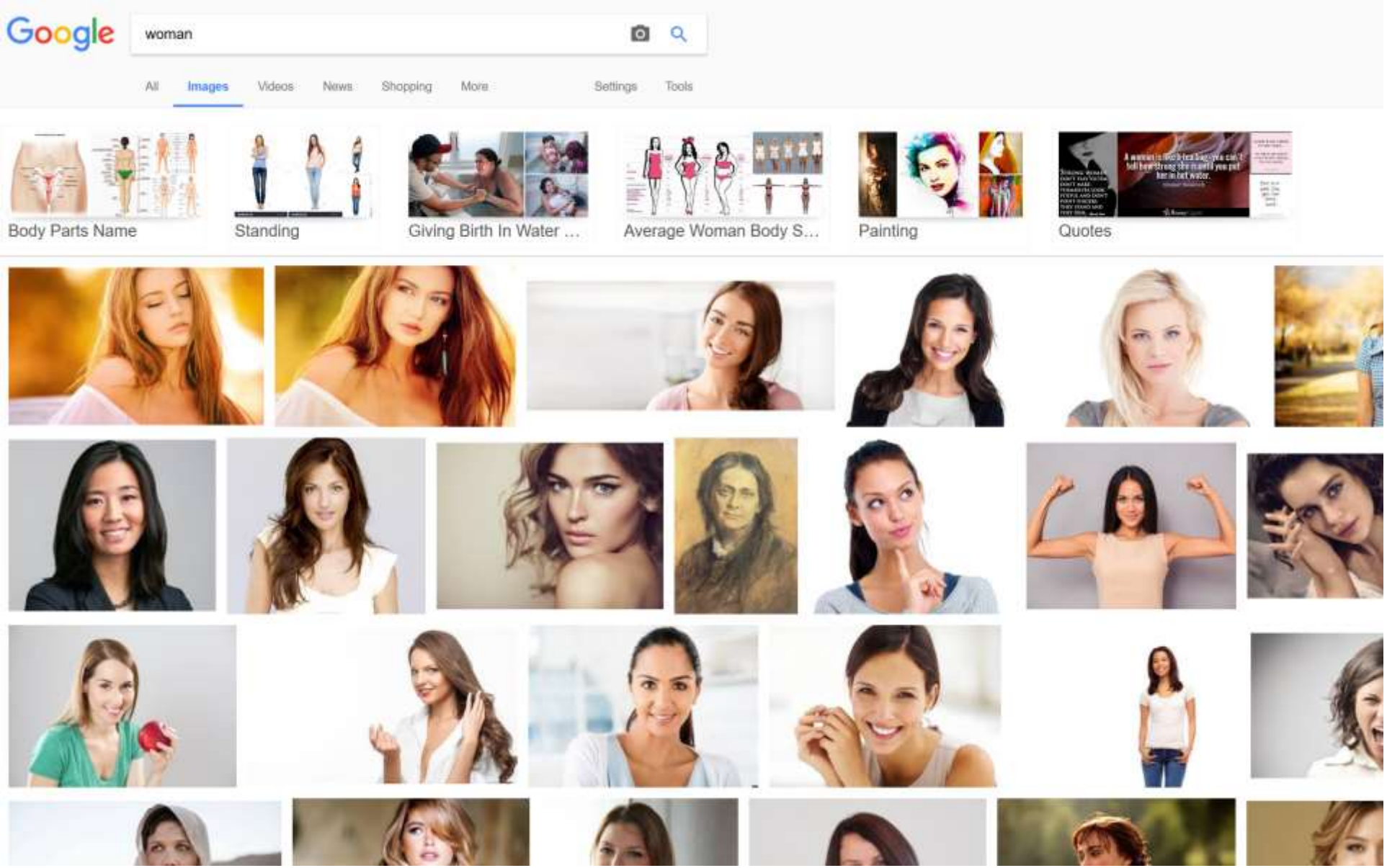
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Settings
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Standing
Giving Birth In Water ...
Average Woman Body S...
Painting
Quotes

Artificial intelligence (AI)

A beauty contest was judged by AI and the robots didn't like dark skin

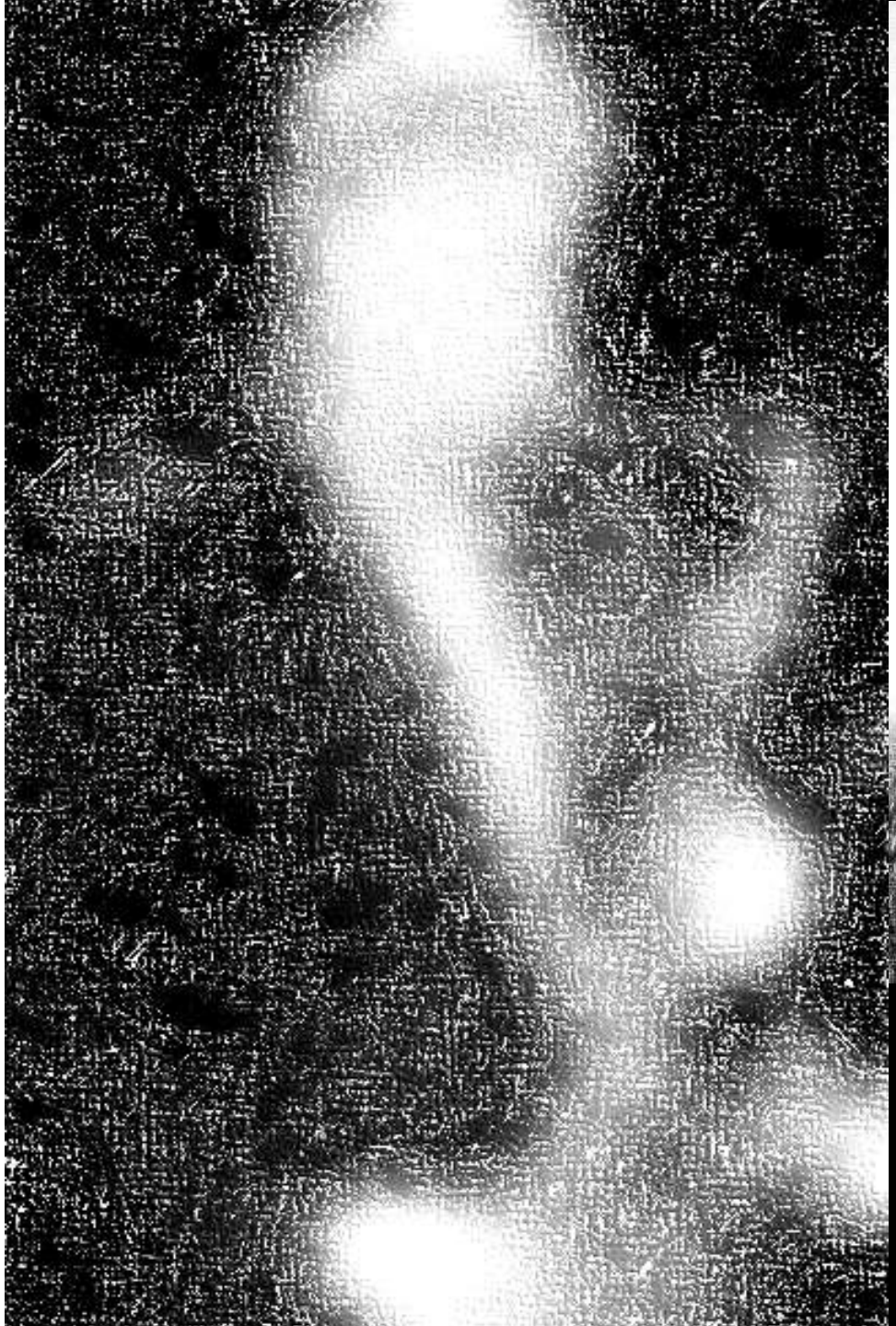
The first international beauty contest decided by an algorithm has sparked controversy after the results revealed one glaring factor linking the winners

Sam Levin in San Francisco
@SamTLevin
email

Thursday 8 September 2016 23.42 BST

One expert says the results offer 'the perfect illustration of the problem' with machine bias. Photograph: Fabrizio Bensch/Reuters

The first international beauty contest judged by "machines" was supposed to use objective factors such as facial symmetry and wrinkles to identify the most attractive contestants. After Beauty.AI launched this year, roughly 6,000 people from more than 100 countries submitted photos in the hopes that artificial intelligence, supported by complex algorithms, would determine that their faces



Reducing patient re-identification risk for laboratory results within research datasets

Ravi V Atreya,[1] Joshua C Smith,[1] Allison B McCoy,[2] Bradley Malin,[1,3] Randolph A Miller[1,4,5]

J Am Med Inform Assoc 2013;**20**:95–101. doi:10.1136/amiajnl-2012-001026

Table 1 Uniqueness for four, five, and six consecutive results of 10 representative laboratory tests and two panels (CBC and CHEM7)

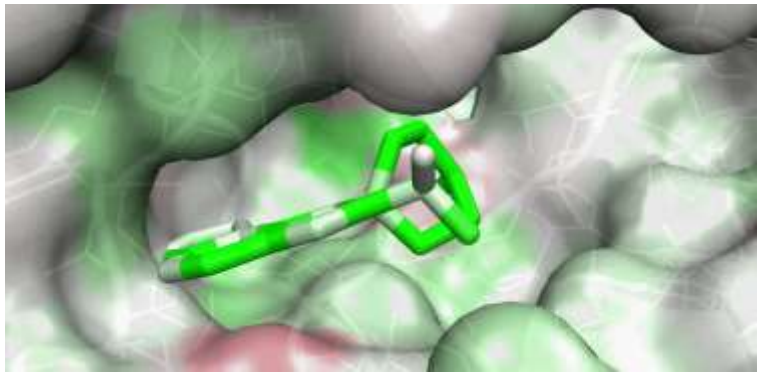
Individual laboratory tests

	Number of consecutive laboratory tests and proportion unique (with number of items qualifying for analysis)		
Test name	4	5	6
pH	0.590 (N=83 941)	0.937 (N=75 954)	0.994 (N=69 175)
Gluc	0.996 (N=133 259)	1.000 (N=110 669)	1.000 (N=93 693)
Ca	0.723 (N=51 905)	0.974 (N=41 140)	0.998 (N=33 283)
LymAbs	0.986 (N=27 591)	0.998 (N=22 361)	1.000 (N=18 615)
PCV	0.195 (N=201 941)	0.575 (N=172 619)	0.886 (N=149 514)
PT-INR	0.343 (N=47 768)	0.559 (N=38 875)	0.725 (N=32 188)
Chol	1.000 (N=780)	1.000 (N=613)	1.000 (N=478)
SGPT	0.996 (N=12 655)	0.999 (N=9807)	1.000 (N=7850)
CK	0.963 (N=6509)	0.979 (N=3659)	0.986 (N=2219)
Alb	0.649 (N=11 520)	0.924 (N=8606)	0.989 (N=6580)
Panel name	Laboratory panels		
CBC (five components)	0.988 (N=211 777)		
CHEM7 (seven components)	0.989 (N=239 253)		

Alb, albumin; Ca, calcium; CBC, complete blood count; CHEM7, blood test measuring electrolytes, glucose, and renal function; Chol, cholesterol; CK, creatine kinase; Gluc, glucose; LymAbs, absolute lymphocytes; PCV, hematocrit (packed cell volume); PT-INR, international normalized ratio for prothrombin time; SGPT, serum glutamic pyruvic transaminase.


10lbs
10lbs
Boston Dynamics

SCIENTIFIC AMERICAN®



AI for Molecular Design

Machine-learning algorithms are speeding up the search for novel drugs and materials

•By Jeff Carbeck on September 14, 2018

https://www.scientificamerican.com/article/ai-for-molecular-design/

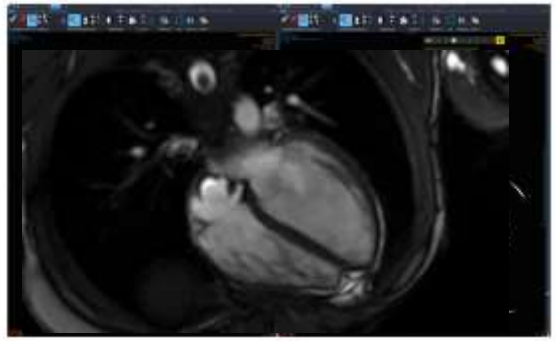
engadget

For a dollar, an AI will examine your medical scan

Zebra-Med's tech helps radiologists find heart, liver, bone and other diseases.

Steve Dent, @stevetdent
10.27.17 in Medicine

A company called Zebra Medical Vision (Zebra-Med) has unveiled a new service called Zebra AI1 that uses algorithms to



examine your medical scans for a dollar each. The deep learning engine can examine CT, MRI and other scans and automatically detect lung, liver, heart and bone diseases.

New capabilities like lung and breast cancer, brain trauma, hypertension and others are "constantly being released," the company says. The results are then passed on to radiologists, saving them time in making a diagnosis or requesting further tests.

DOCTOR IS IN

Google is using 46 billion data points to predict the medical outcomes of hospital patients

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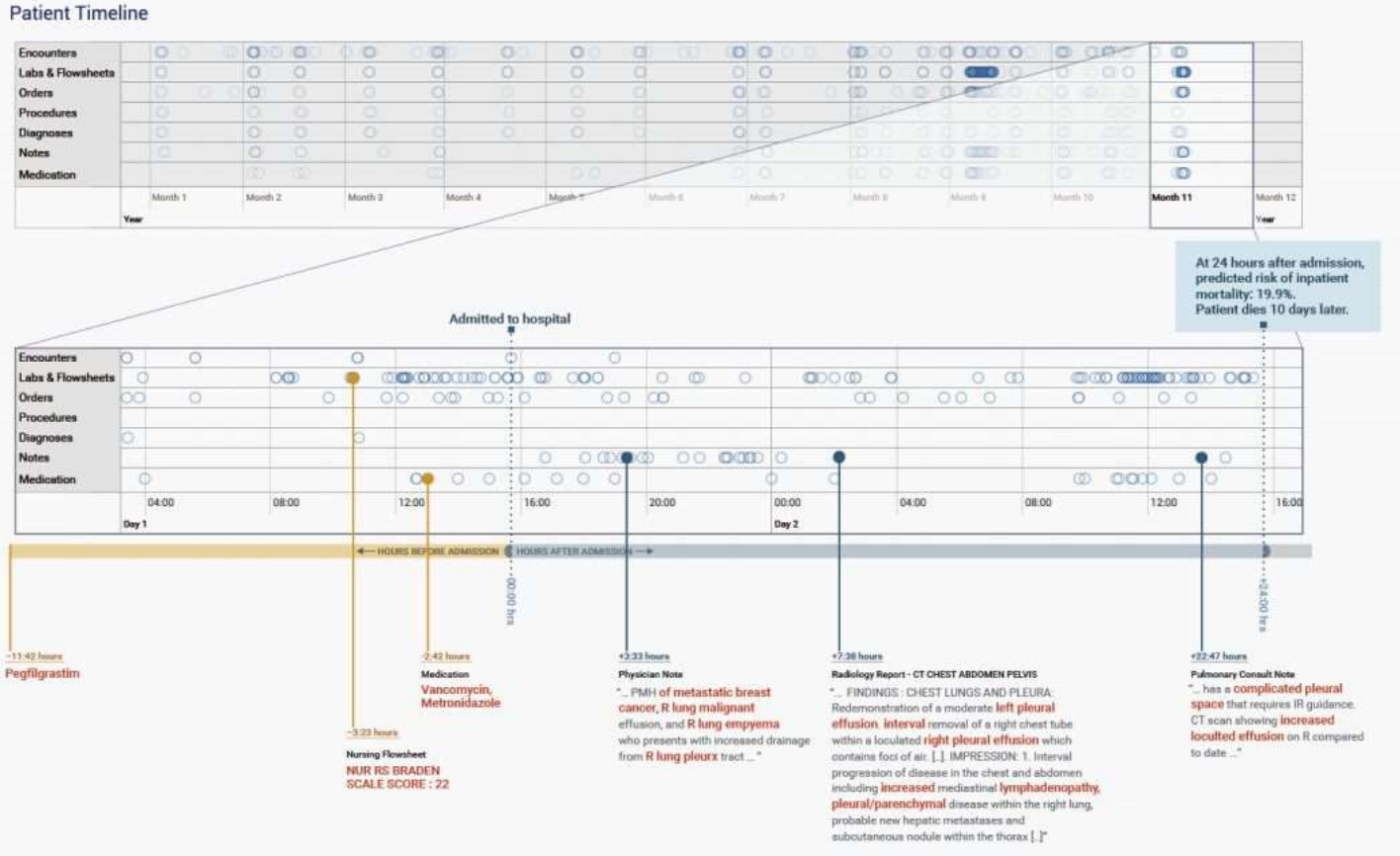
WRITTEN BY

Dave Gershgorn

OBSESSION

Machines with Brains

January 27, 2018



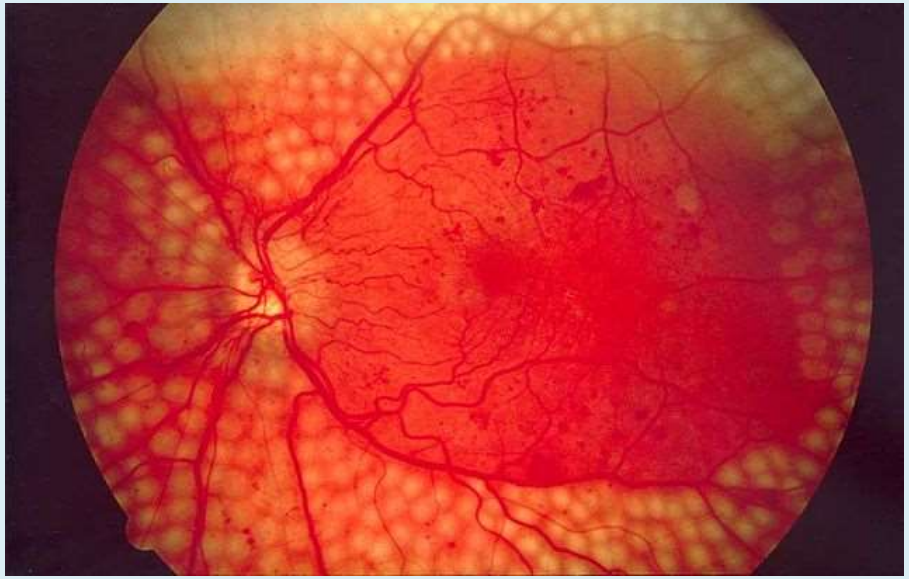
EDITORIAL

Artificial Intelligence With Deep Learning Technology Looks Into Diabetic Retinopathy Screening

Tien Yin Wong, MD, PhD; Neil M. Bressler, MD

Medium, severe retinopathy
Retinal oedema

Sensibility 87% - 90%
Specificity 98%



Retina for laser treatment when diabetic disease

128 175 images required

JAMA. 2016;316(22):2366-2367.
oi:10.1001/jama.2016.17563

THE LANCET
Oncology

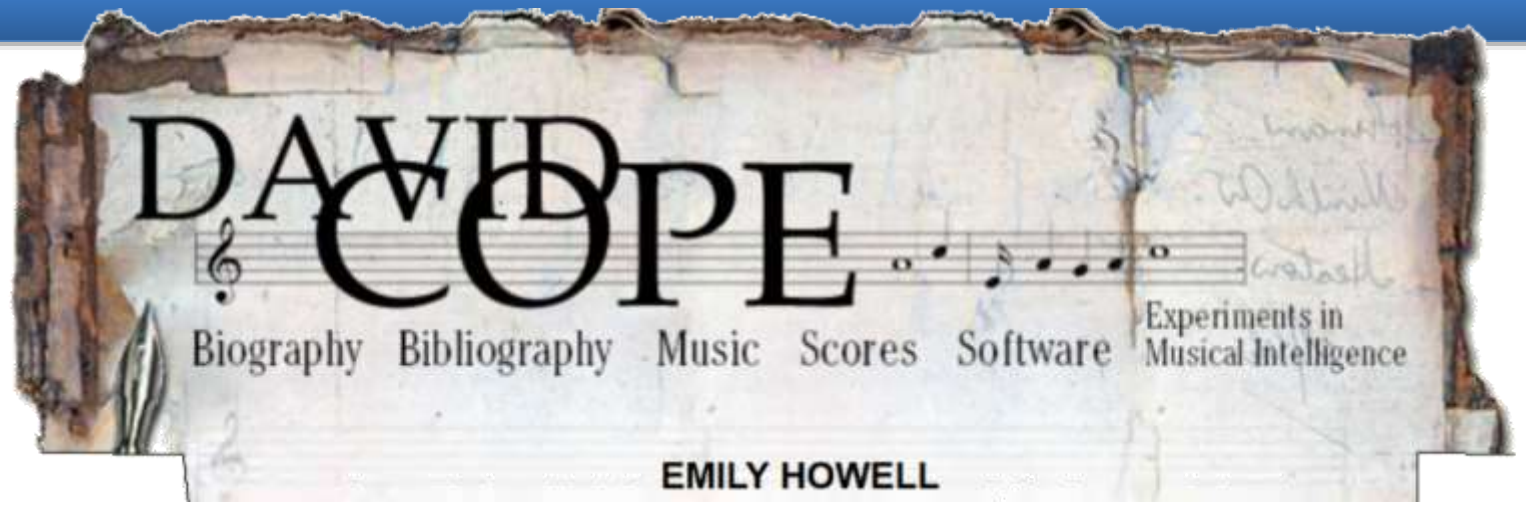
A radiomics approach to assess tumour-infiltrating CD8 cells and response to anti-PD-1 or anti-PD-L1 immunotherapy: an imaging biomarker, retrospective multicohort study
Sun R et al, DOI:https://doi.org/10.1016/S1470-2045(18)30413-3

Cancer : AI predicts response to immunotherapy

Nikos Paragios, co-author, prof in math

Only one out of 5 patients will have a good response to treatment, and one will suffer severe side effects, three will have no response and usual side effects.

https://www.sciencesetavenir.fr/high-tech/intelligence-artificielle/cancer-une-intelligence-artificielle-predit-les-chances-de-succes-de-l-immunotherapie_126965



Bach style chorale

Emmy Vivaldi

Emmy Beethoven beg 2

http://artsites.ucsc.edu/faculty/cope/Emily-howell.htm

AI in Musique

Experiences

David Cope, The Emily Howell project