cyber - game

Could Gamers Form The Military's Future?

forces.net/news/could-gamers-form-militarys-future

Tom Sables 18th December 2020 at 4:48pm

Gaming

Forces News sent a reporter inside the gaming world to meet potential recruits with a passion for defence.

Gaming has become a go-to leisure activity for many in recent years, with the coronavirus lockdown only boosting online numbers further.

Military personnel, all coming from a 'civvy street' of their own, have been no exception – logging on while off-duty more and more as games develop.

However, official strategy is also taking notice of the virtual phenomenon.

The British military has continued to step up its engagement with the general public at gaming festivals and online.

Competing, interacting and informing, personnel have appeared at massive, open events such as Insomnia, training on base to raise their profile.

For gamers, the UK Armed Forces offers the chance to operate and develop increasingly futuristic systems – getting hands-on with the kit they have only seen through screens.

But what does the military gain from this new wave of recruits, and how can they turn what a recruitment campaign labelled 'binge gamers' into the personnel of the future?

Forces News spoke to Major Tim Elliott, Head of Army E-sports.

liquid -shed

CANCER

A mathematical model of ctDNA shedding predicts tumor detection size

Stefano Avanzini[1], David M. Kurtz[2], Jacob J. Chabon[3,4], Everett J. Moding[4,5], Sharon Seiko Hori[1,6], Sanjiv Sam Gambhir[1,4,6,7,8]*, Ash A. Alizadeh[2,3,4], Maximilian Diehn[3,4,5], Johannes G. Reiter[1,4,7,9]†

Early cancer detection aims to find tumors before they progress to an incurable stage. To determine the potential of circulating tumor DNA (ctDNA) for cancer detection, we developed a mathematical model of tumor evolution and ctDNA shedding to predict the size at which tumors become detectable. From 176 patients with stage I to III lung cancer, we inferred that, on average, 0.014% of a tumor cell's DNA is shed into the bloodstream per cell death. For annual screening, the model predicts median detection sizes of 2.0 to 2.3 cm representing a ~40% decrease from the current median detection size of 3.5 cm. For informed monthly cancer relapse testing, the model predicts a median detection size of 0.83 cm and suggests that treatment failure can be detected 140 days earlier than with imaging-based approaches. This mechanistic framework can help accelerate clinical trials by precomputing the most promising cancer early detection strategies.

INTRODUCTION

Patients with early-stage cancer are more likely to be cured than patients with advanced-stage cancer (*1*–*4*). For example, the 5-year survival rate of patients with lung cancer who are diagnosed at a localized stage is 57%, while for those diagnosed with distant metastases, it is only 5% (*5*). Unfortunately, only 16% of lung cancers are diagnosed at a localized stage. Recently, multiple studies presented new minimally invasive approaches based on cell-free DNA (cfDNA) to detect cancer from blood samples (*6*–*15*). Most cfDNA in the bloodstream is derived from normal cells, while a small proportion is derived from tumor cells and is known as circulating tumor DNA (ctDNA). Presumably, ctDNA is shed by tumor cells undergoing apoptosis or necrosis (*16*–*18*). Small tumors would therefore be harder to detect because fewer tumor cells undergo cell death and shed ctDNA into the bloodstream.

Previous studies showed that 30 to 100% of symptomatic tumors (mostly larger than 3 cm^3) can be detected from a 10- to 15-ml blood sample (*8*, *9*, *14*). However, assessing whether blood-based tests can also detect still asymptomatic tumors at sizes smaller than 3 cm^3 with a sufficiently high specificity to reduce cancer mortality requires elaborate clinical trials with tens of thousands of participants. While such trials are already under way, we lack the mechanistic frameworks necessary to predict the expected size of tumors that would be detected with a given sequencing approach and sampling frequency (*19*). Such frameworks would enable investigators to a priori choose a sequencing and sampling strategy with the highest success probability for a given screening population. For example, how would the performance of a screening test change for a subpopulation with tumors with half as many mutations (e.g., lung cancers of nonsmokers versus smokers)? Motivated by these fundamental questions, we developed a stochastic mathematical model of cancer evolution and biomarker shedding to study the potential and the limitations of blood-based cancer early detection tests across various scenarios. This mechanistic framework will help to predict the performance of ctDNA-based tumor detection approaches and thereby inform and optimize the design of future clinical trials to find cancers earlier.

RESULTS

Mathematical model of cancer evolution and ctDNA shedding

We first consider early-stage lung cancers with a typical tumor volume doubling time of 181 days, leading to a net growth rate of $r = \ln(2)/181 \approx 0.4\%$ per day (*20*). Lung cancer cells approximately divide with a birth rate of $b = 0.14$ per day (*21*) and die with a death rate of $d = b - r = 0.136$ per day (Fig. 1A). For now, we assume that each tumor cell releases ctDNA into the bloodstream during apoptosis with a ctDNA shedding probability of q_d per cell death. This assumption implies that the amount of ctDNA linearly correlates with tumor burden, and the slope of the linear regression has to be 1 in logarithmic space.

By reanalyzing ctDNA sequencing data and tumor volumes of 176 patients with stage I to III non–small cell lung cancer of three cohorts (*14*, *22*, *23*), we found that haploid genome equivalents (hGE) per plasma ml indeed correlate with tumor volume with a slope of 0.9997 [95% confidence interval (CI), 0.78 to 1.2; $R^2 = 0.32$; red line in Fig. 1B; Materials and Methods]. We found similar linear regression slopes and intercepts in the separated three cohorts (fig. S1). For the combined dataset, linear regression predicted 0.21 hGE per plasma ml for 1 cm^3 of tumor volume (95% CI, 0.15 to 0.28; 95% prediction interval, 0.0033 to 13 hGE per plasma ml for a fixed slope of 1; fig. S2B). On the basis of these analyses, we inferred a mean shedding probability of $q_d \approx 1.4 \times 10^{-4}$ hGE per cell death

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RUSI
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Royal United Services Institute
for Defence and Security Studies

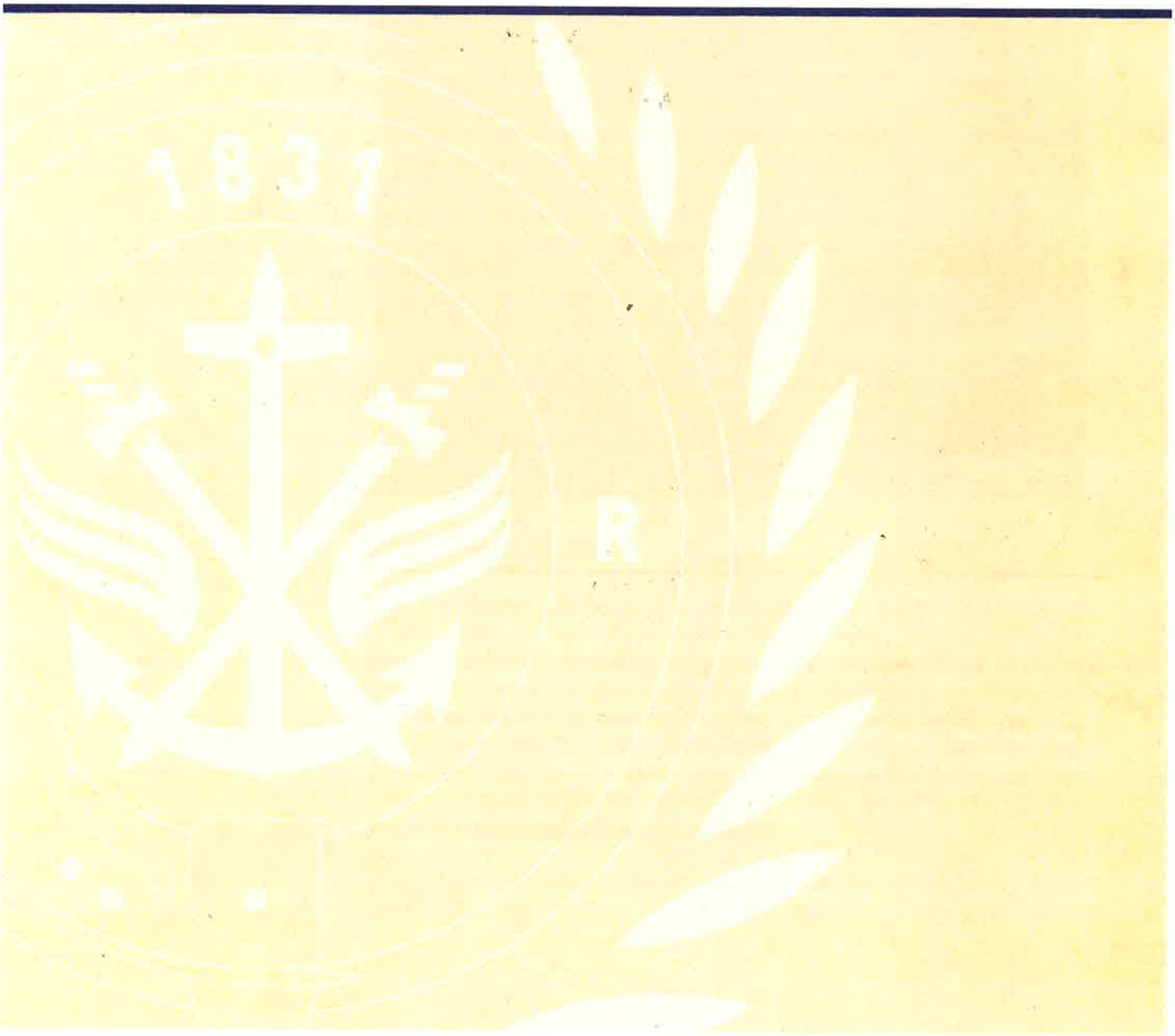
1) gray
– ~~Shad~~ reviews

BRIEFING PAPER

The Case for Joint Military–Industry Greyzone Exercises

2) resilience
– reviews

Elisabeth Braw



right - reviews

Far-Right Extremism Steals the Show in 2020

rusi.org/commentary/far-right-extremism-steals-show-2020

November 26, 2020

Throughout a year defined by the global pandemic, racial inequality movements and political polarisation, the US has been in the spotlight as the epicentre of social upheaval and amplification of far-right extremism.

Far-right extremism is not a new phenomenon. However, it has been given a renewed voice and expanded its influence and impact in 2020. The far-right encompasses a wide range of ideologies, including white supremacy, ultra-nationalism and xenophobia and it is also known by many names, including 'right-wing extremism'. However, across the many facets of its nebulous nature, it has found a new level of amplification this year due to global events. While this amplification has echoes around the word, the US has often been at the centre of the conversation.

Resisting the Pandemic Response

The coronavirus pandemic and subsequent government measures to contain the virus have given the far-right a new voice and platform. Far-right extremist sentiment has quickly adapted to this crisis, repurposing existing narratives to feed the environment of conspiracy and suspicion which has emerged through the pandemic. This flow of extremist content online, coupled with the increased amount of time people are spending on the internet due to lockdowns, has allowed extreme right-wing content to seep further and further into the mainstream. For example, as social media coverage of conspiracy theories has increased so has their presence in mainstream media. Even when fact-checking, media coverage can amplify the impact of conspiracies.

However, far-right operations have not been limited to the virtual world. Anti-lockdown protests have taken place globally, often hosting an underlying array of anti-government, racial and other extremist narratives. In the US this has been particularly prominent, with these protests largely targeting states with Democrat or more liberal governors who impose

resilience
-workplace

OSHA's Role in Combating the COVID-19 Pandemic

theregreview.org/2020/11/02/mendeloff-osha-role-combating-covid-19-pandemic

John Mendeloff

November 2, 2020

More information sharing and enforcement by OSHA and state agencies could better protect workers from COVID-19.

Workplaces are a significant source of infection for COVID-19, as shown not only by the illnesses of health care workers, but also by the tens of thousands of positive cases and roughly 200 deaths at meatpacking plants. The Occupational Safety and Health Administration (OSHA) has responsibilities for keeping employees safe at work, but it has played a fairly limited role in addressing COVID-19.

Some critics have called for a more aggressive enforcement role from OSHA. I agree that some increase in enforcement, including a new standard for infectious diseases, would be beneficial. But in addition, it is important to improve our ability to identify cases of infection where the workplace is a likely place of transmission. The objective should be to facilitate employers' and employees' efforts in identifying infected individuals. In addition to aiding in identifying cases, employers can and should aid in preventing transmission.

Before discussing what role OSHA should play, it bears noting what its role has been to date during the pandemic.

coronavirus
-Dx

Fierce Medtech's Top 10 stories of 2020: COVID testing's ups and downs

fiercebiotech.com/medtech/fierce-medtech-s-top-10-stories-2020-covid-testing-s-ups-and-downs

Our most-read stories of the year all tap into a single idea: How can we learn as much as we can about this pandemic threat? (Getty Images)

In a typical year, I'd compile our annual roundup of top stories while searching for photos of gold confetti and festive ribbons—champagne, maybe, or some fireworks—while the tune of "Auld Lang Syne" runs through my head, hoping to evoke an air of happy celebration and offer, in our small way, a salute to the accomplishments of the medtech industry during our last trip around the sun.

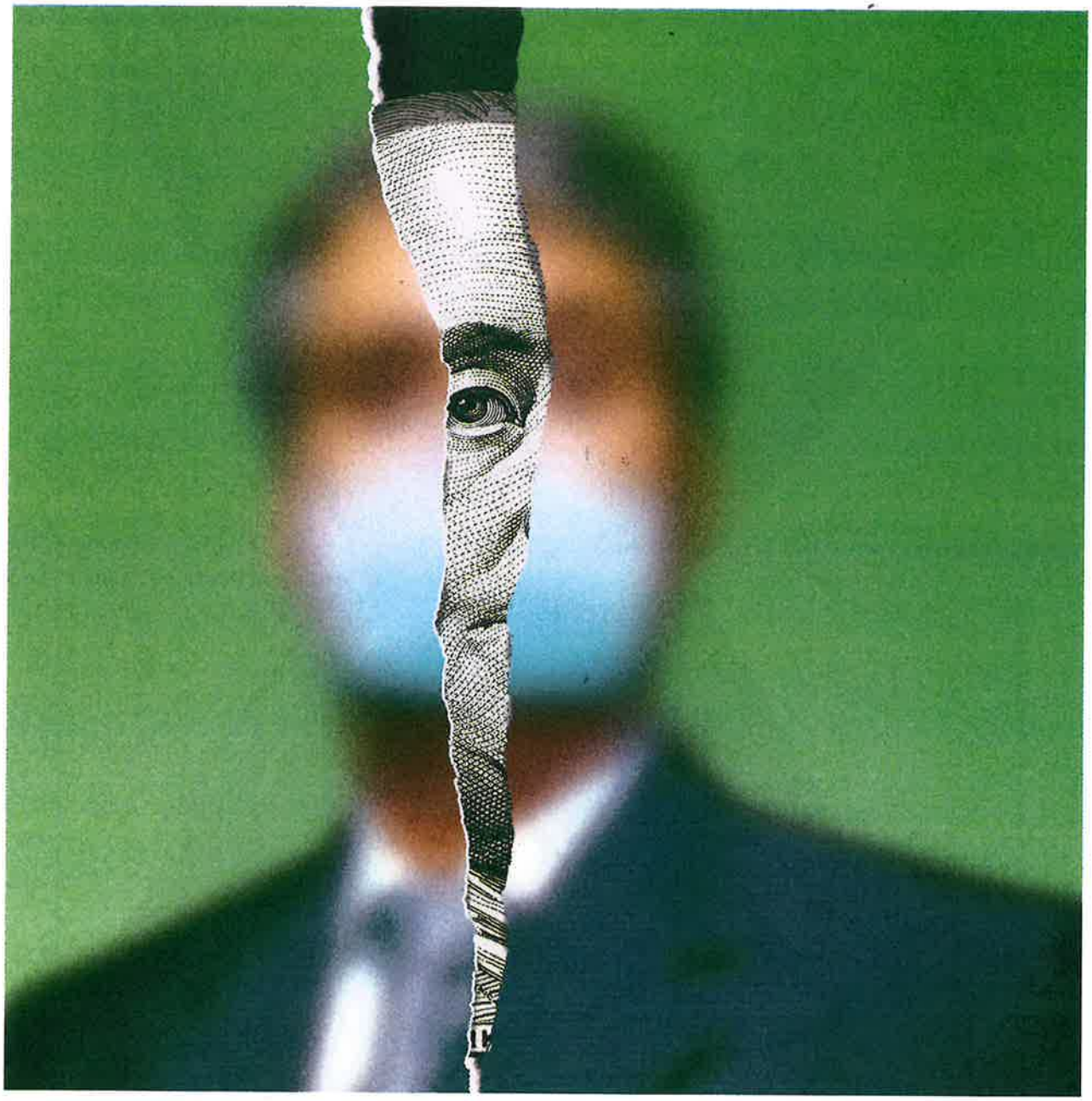
This year? Not so much.

But despite everything 2020 and COVID-19 brought us and took away—with immeasurable losses of life and ways of living—accomplishments abound. This is no time at all for old acquaintances to be forgot, and never bringing them to mind would only compound tragedy.

1) innovation - VC 2) essays - greed

Why venture capital doesn't build the things we really need

technologyreview.com/2020/06/17/1003318/why-venture-capital-doesnt-build-the-things-we-really-need



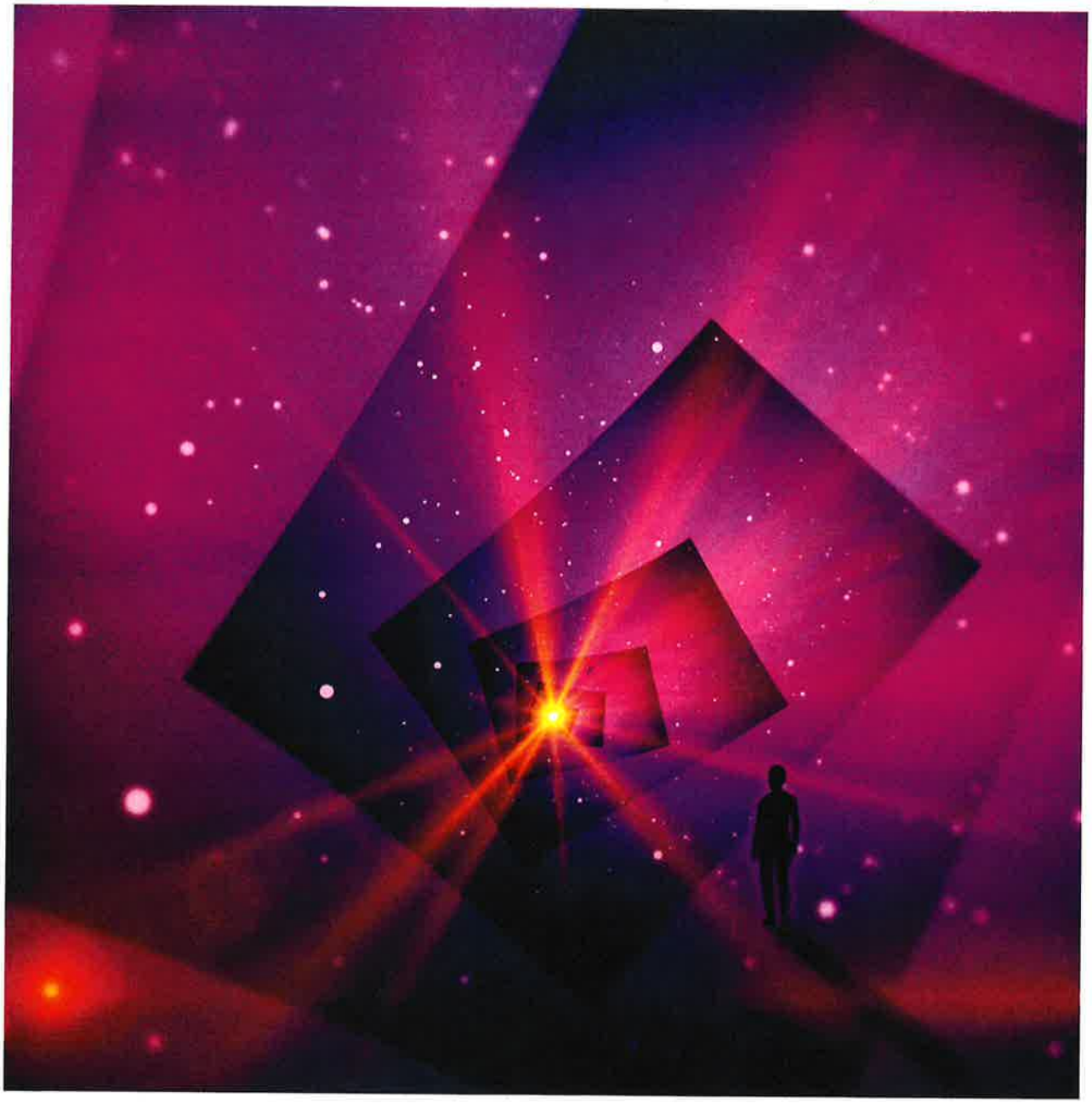
I felt bad asking Zack Gray to repeat his story. He was used to it, he said. It's the founding tale of his startup, Ophelia; he'd already told part of it in his commencement speech at Wharton, and to potential investors.

"There was a girl in my life," he started. "I call her my girlfriend. We met when I was 14." They dated, on and off, and stayed friends.

Resilience
– Governance

Humanity is stuck in short-term thinking. Here's how we escape.

technologyreview.com/2020/10/21/1009443/short-term-vs-long-term-thinking



Every so often, I ask my daughter about the future. When she was three, she had only a basic concept of time, with little awareness of clocks or calendars. She could understand *The Very Hungry Caterpillar*, a classic children's book about a creature gorging on food over a week, but when she would tell the story back to me, she would mix up the days. Time, for her, was disordered. By the age of five, however, she had figured out how

1) risk - climate

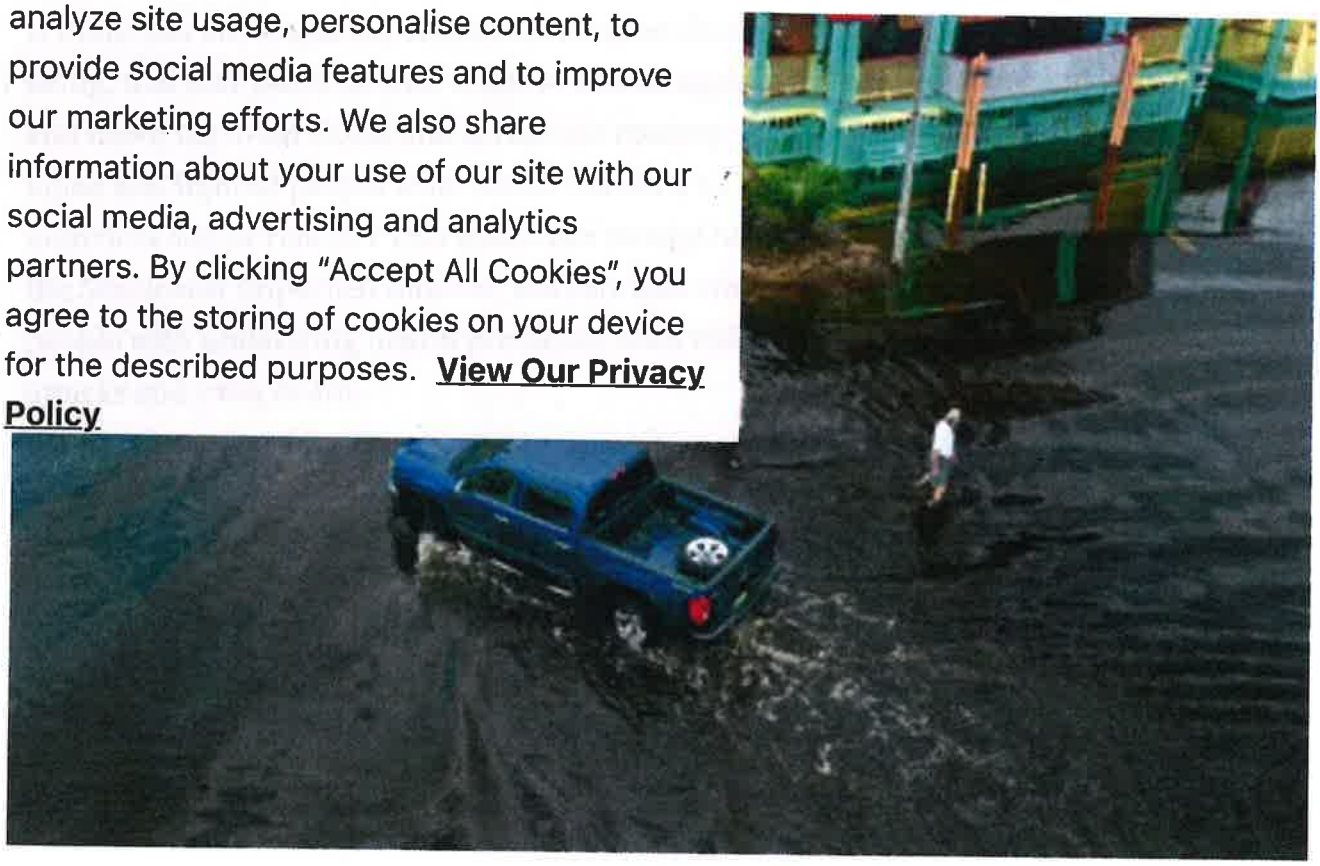
2) resilience - reviews

CLIMATE | OPINION

We Need a National Institute of Climate Change and Health

The NIH has a budget of over $40 billion—but spends a measly $9 million on this looming public health emergency

By Howard Frumkin, Richard J. Jackson on November 22, 2020



The military is calling in AI for support

axios.com/military-artificial-intelligence-weapons-systems-e14834fe-0edd-44a4-9daf-38fb7c119a33.html

Illustration: Eniola Odetunde/Axios

For all our fears about Terminator-style killer robots, the aim of AI in the U.S. military is likely to be on augmenting humans, not replacing them.

Why it matters: AI has been described as the "third revolution" in warfare, after gunpowder and nuclear weapons. But every revolution carries risks, and even an AI strategy that focuses on assisting human warfighters will carry enormous operational and ethical challenges.

Driving the news: On Tuesday, Armenia accepted a cease-fire with its neighbor Azerbaijan to bring a hopeful end to their brief war over the disputed enclave of Nagorno-Karabakh.

> Azerbaijan dominated the conflict in part thanks to the ability of its fleets of cheap, armed drones to destroy Armenia's tanks, in what military analyst Malcolm Davis called a "potential game-changer for land warfare."

An even bigger game-changer would be if such armed drones were made fully autonomous, but for the foreseeable future such fears of "slaughterbots" that could be used to kill with impunity appear overstated, says Michael Horowitz, a political scientist at the

CATS - decision

5 questions for Mervyn King on managing uncertainty and employing expertise

aei.org/economics/5-questions-for-mervyn-king-on-managing-uncertainty-and-employing-expertise

November 19, 2020

Blog Post

AEIdeas

November 19, 2020

When can we rely on the predictions and projections of experts, and when are policymakers simply forced to deal with uncertainty? In the latter event, how should uncertainty be handled? I recently discussed these questions, and many more, with Lord Mervyn King.

Mervyn is a professor of both economics and law at New York University, and he is also the co-author, along with John Kay, of Radical Uncertainty: Decision-Making beyond the Numbers.

Below is an abbreviated transcript of our conversation. You can read our full discussion here. You can also subscribe to my podcast on Apple Podcasts or Stitcher.

Pethokoukis: In the 2020 election, it seems that the polls overestimated Biden's support. Is this an example of the kind of radical uncertainty that the book addresses?

King: Yes. Radical uncertainty lies between events that we can happily use the laws of probability to describe — events which are repeatable so we can compute the probabilities — and events in which the probability is unimaginable.

The 2020 election was an example of the latter. It was a one-off race — it was not going to be repeated. So the predictive models tended to confuse rather than help us think about the outcome. The issue is that these models assume a great deal about human behavior, and these things change from election to election. For instance, in the 2016 Brexit referendum, young people did not vote. So in 2017, the modelers assumed they could give less weight to young people. That assumption turned out to be wrong when young people did come out and vote that year.

People's behavior changes from one period to the next. So the models — not just in this area, but economic models and COVID-19 epidemiological models, for that matter — are bad at predicting the future. So the lesson is to keep options open and wait until you know the outcome.

CNS
-neurotech

The tricky ethics of neurotechnologies

axios.com/ethics-brain-machine-interfaces-d50b6618-b2b3-4bc1-960a-c27f73be3e63.html

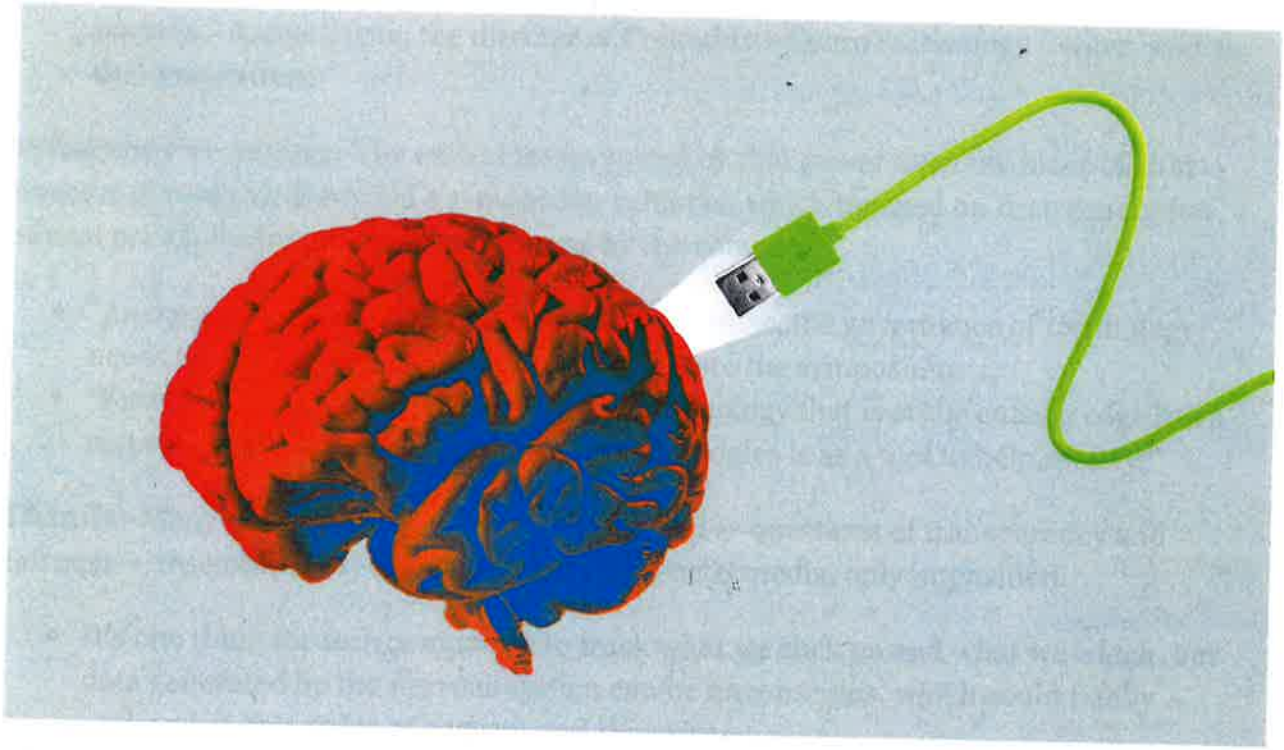


Illustration: Lazaro Gamio/Axios

As the science of brain-computer interfaces (BCI) and other neurotechnologies progresses, researchers are calling for ethical guidelines to be established now — before the technology fully matures.

Why it matters: We're still far away from technologies that fully access and even read the human brain, but the sheer power of such tools — and the highly personal data they could gather — means society needs to determine what they should do before they actually can do it.

What's happening: Columbia University's NeuroRights Initiative held a symposium today in conjunction with IBM on the scientific, security and social issues raised by neurotech.

> Today scientists are able to read and write information in the brains of animals, and they've developed interfaces that allow humans to move computer cursors and more with only their thoughts.

1) resilience
- reviews

DECEMBER 2020 LAW, GOVERNMENT & SOCIETY

America After COVID

How we can defeat the 'new misery' and thrive

by Nicholas Eberstadt

TWO VERY DIFFERENT PATHS FOR AMERICA LIE BEFORE US AT THE END of the COVID pandemic. One is to a future of stagnation and division. The other is to a future of revitalization and hope. And the choice is ours to make. We can grasp the future that includes national solidarity and progress for all. It is entirely doable. We already pretty much know how. We just have to *want* it—and *not lose heart*.

I

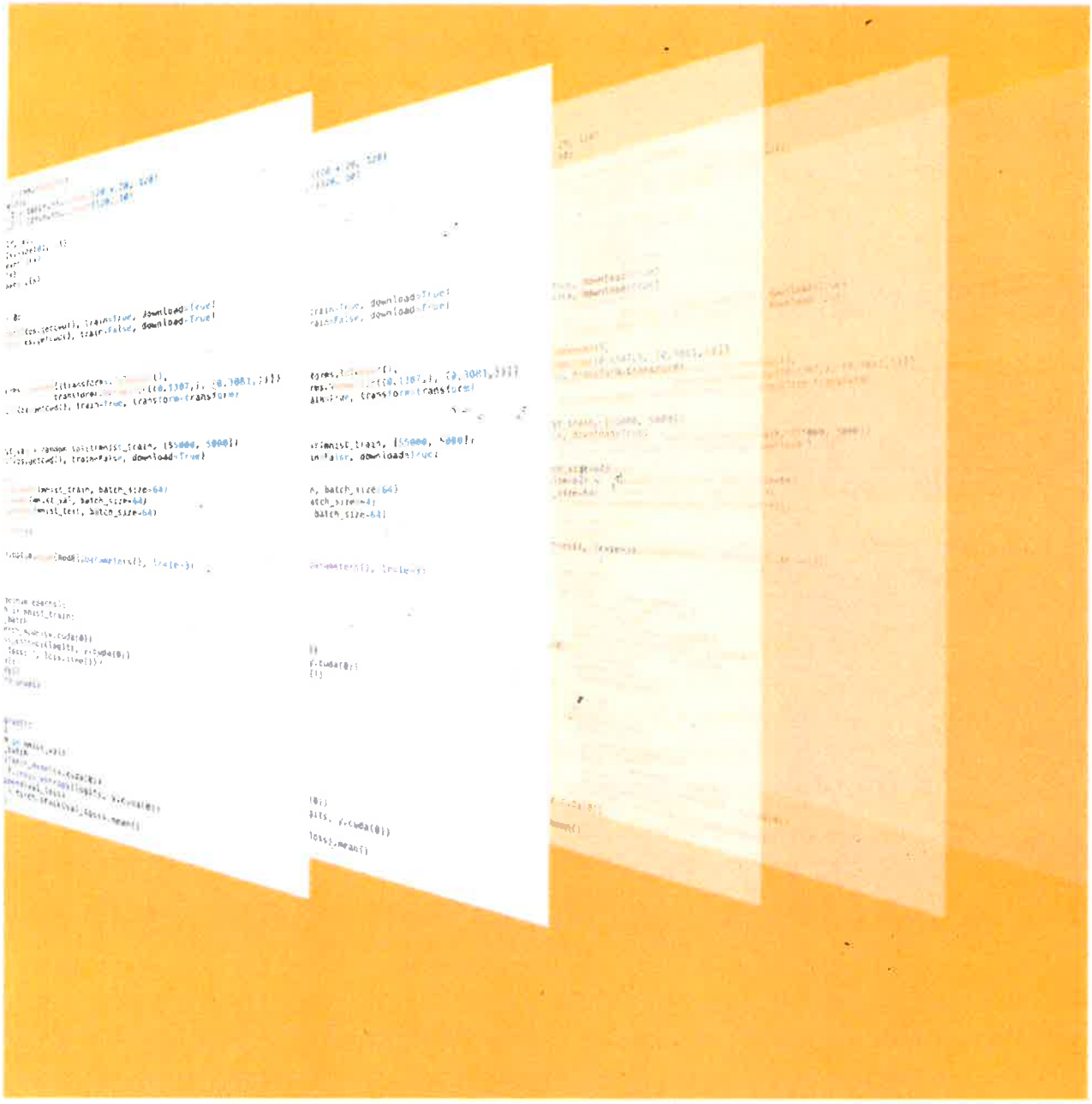
AMERICA IS in the midst of its greatest crisis since the Second World War. Under the pressure of the pandemic, fault lines in our country have been painfully exposed. We endure not only a socioeconomic emergency but an explosion of anger and radicalized violence in our streets. These troubles have historical roots: problems long festering and long ignored.

Washington has responded to the pandemic with an unprecedented peacetime mobilization of national resources. Congress has authorized trillions of dollars in spending to support distressed businesses and households, and the Federal Reserve System has committed trillions more —with no end yet in sight.

automated
- validation

AI is wrestling with a replication crisis

technologyreview.com/2020/11/12/1011944/artificial-intelligence-replication-crisis-science-big-tech-google-deepmind-facebook-openai



Last month Nature published a damning response written by 31 scientists to a study from Google Health that had appeared in the journal earlier this year. Google was describing successful trials of an AI that looked for signs of breast cancer in medical images. But according to its critics, the Google team provided so little information about its code and how it was tested that the study amounted to nothing more than a promotion of proprietary tech.

artificial
- reviews

AI pioneer Geoff Hinton: "Deep learning is going to be able to do everything"

technologyreview.com/2020/11/03/1011616/ai-godfather-geoffrey-hinton-deep-learning-will-do-everything

- On the AI field's gaps: "There's going to haye to be quite a few conceptual breakthroughs...we also need a massive increase in scale."
- On neural networks' weaknesses: "Neural nets are surprisingly good at dealing with a rather small amount of data, with a huge numbers of parameters, but people are even better."
- On how our brains work: "What's inside the brain is these big vectors of neural activity."

The modern AI revolution began during an obscure research contest. It was 2012, the third year of the annual ImageNet competition, which challenged teams to build computer vision systems that would recognize 1,000 objects, from animals to landscapes to people.

In the first two years, the best teams had failed to reach even 75% accuracy. But in the third, a band of three researchers—a professor and his students—suddenly blew past this ceiling. They won the competition by a staggering 10.8 percentage points. That professor was Geoffrey Hinton, and the technique they used was called deep learning.

robotics

Don't Fear the Robots, and Other Lessons From a Study of the Digital Economy

nytimes.com/2020/11/17/technology/digital-economy-technology-work-labor.html

Steve Lohr

November 17, 2020

Continue reading the main story

L. Rafael Reif, the president of Massachusetts Institute of Technology, delivered an intellectual call to arms to the university's faculty in November 2017: Help generate insights into how advancing technology has changed and will change the work force, and what policies would create opportunity for more Americans in the digital economy.

That issue, he wrote, is the "defining challenge of our time."

Three years later, the task force assembled to address it is publishing its wide-ranging conclusions. The 92-page report, "The Work of the Future: Building Better Jobs in an Age of Intelligent Machines," was released on Tuesday.

The group is made up of M.I.T. professors and graduate students, researchers from other universities, and an advisory board of corporate executives, government officials, educators and labor leaders. In an extraordinarily comprehensive effort, they included labor market

IEEE Experts Weigh Social Implications of Emerging Technologies in Future Pandemics

spectrum.ieee.org/news-from-around-ieee/the-institute/ieee-member-news/ieee-experts-weigh-social-implications-of-emerging-technologies-in-future-pandemics

coronavirus
- p082

08 Oct 2020 | 18:00 GMT

The technologies include big data, blockchain, 5G, and drones

By IEEE Future Directions

Illustration: iStockphoto

Suggested Wiley-IEEE Reading

‘Zombie’ Microbes Redefine Life’s Energy Limits

quantamagazine.org/zombie-microbes-redefine-lifes-energy-limits-20200812

By Christie Wilcox

revodevo

Energy drives the planet; it’s the currency that all living things use to grow, develop and function. But just how little energy do cells need to get by? Sediment-dwelling microbes below the seafloor — which may outnumber the microbial cells found in the oceans themselves — are providing some surprising answers. The organisms not only challenge what scientists thought they knew about life’s energy needs, but hint at new ways of defining what life is and where we might find it.

Last week in *Science Advances*, researchers presented the most complete picture to date of the strange, hidden biosphere beneath the seafloor. Ocean drilling expeditions have repeatedly probed those lightless depths and uncovered cells that survive almost in suspended animation, consuming orders of magnitude less energy than their neighbors at the surface. But the model presented in the new study shows that this zombielike state probably applies to the vast majority of microbes in ocean sediments — and that they typically subsist on energy budgets approaching a theoretical minimum for life.

Abstractions navigates promising ideas in science and mathematics. Journey with us and join the conversation.

Neural Dendrites Reveal Their Computational Power

quantamagazine.org/neural-dendrites-reveal-their-computational-power-20200114

neuroscience

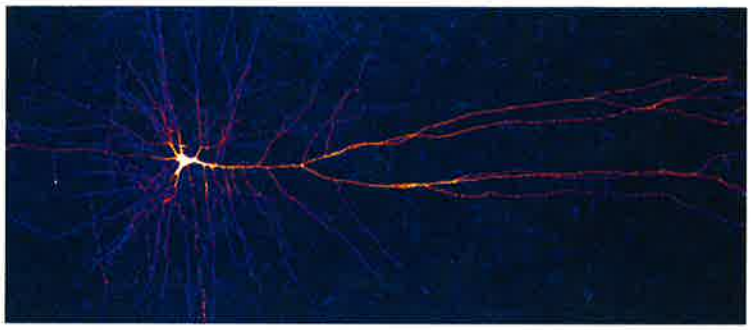
information < CNS

Hidden Computational Power Found in the Arms of Neurons

The dendritic arms of some human neurons can perform logic operations that once seemed to require whole neural networks.

15

Read Later



Thin dendrites resembling a plant's roots radiate in all directions from the cell body of this cortical neuron. Individual dendrites may process the signals they receive from adjacent neurons before passing them along as inputs to the cell's overall response.

Imre Vida (NeuroCure Cluster, Charité – Universitätsmedizin Berlin)

The information-processing capabilities of the brain are often reported to reside in the trillions of connections that wire its neurons together. But over the past few decades, mounting research has quietly shifted some of the attention to individual neurons, which seem to shoulder much more computational responsibility than once seemed imaginable.

The latest in a long line of evidence comes from scientists' discovery of a new type of electrical signal in the upper layers of the human cortex. Laboratory and modeling studies have already shown that tiny compartments in the dendritic arms of cortical neurons can

information ~~cats~~ - CNS

aiin.healthcare/topics/emerging-technologies/neural-network-simulates-rational-thought-processes

Sophisticated neural network simulates rational thought processes

Dave Pearson | December 23, 2020 | Emerging Technologies

Researchers have used explainable AI to break down a hypothetical animal's foraging behaviors into measurable cognitive dynamics. They hope their success leads to a better understanding of how humans think—or, as the researchers put it, how the "neural substrates of thought" operate.

The work was conducted at Baylor College of Medicine and Rice University, both in Houston, and is described in a study published by *Proceedings of the National Academy of Sciences*.

Corresponding author Xaq Pitkow, PhD, and colleagues explain how they trained an artificial neural network to complete a simple foraging assignment. The task required the network to integrate evidence acquired along the way while also remembering previous progress and planning subsequent moves.

"Our method successfully recovered the agent's internal model and subjective preferences and found neural computations consistent with that rational model," the authors comment in their discussion section.

In a Baylor blog post, science writer Ana María Rodríguez, PhD, writes that the study team used a method of tracing thought processes called inverse rational control. The method entails observing a behavior and inferring beliefs or thoughts that best explain the observed

corporations - Philips

Philips to Acquire BioTelemetry

globenewswire.com/news-release/2020/12/18/2147552/0/en/Philips-to-Acquire-BioTelemetry.html

BioTelemetry, Inc.

- *Philips to acquire BioTelemetry, Inc. for USD 72.00 per share; implied enterprise value of USD 2.8 billion (approx. EUR 2.3 billion)*
- *Acquisition is a strong fit with Philips' strategy to transform the delivery of healthcare: combination of Philips' leading patient monitoring position in the hospital with BioTelemetry's leading cardiac diagnostics and monitoring position outside the hospital*
- *With 2019 sales of USD 439 million, BioTelemetry annually monitors over 1 million cardiac patients remotely; its portfolio includes wearable heart monitors, AI-based data analytics and services*
- *Combination will result in significant synergies driven by cross-selling opportunities, geographical expansion, portfolio innovation synergies, and productivity gains*
- *BioTelemetry business is expected to deliver double-digit growth and improve its Adjusted EBITA margin to over 20% by 2025; acquisition will be sales growth and adjusted EBITA margin accretive for Philips in 2021*

MALVERN, Pa., Dec. 18, 2020 (GLOBE NEWSWIRE) -- BioTelemetry, Inc. (NASDAQ: BEAT) , the leading remote medical technology company focused on the delivery of health information to improve quality of life and reduce cost of care, today announced that they have entered into a definitive merger agreement with Royal Philips (NYSE: PHG, AEX: PHIA).

Royal Philips, a global leader in health technology, and BioTelemetry, Inc., a leading U.S.-based provider of remote cardiac diagnostics and monitoring, today announced that they have entered into a definitive merger agreement. Pursuant to the agreement, Philips will commence a tender offer to acquire all of the issued and outstanding shares of BioTelemetry for USD 72.00 per share, to be paid in cash upon completion. This represents a 16.5 percent premium to BioTelemetry's closing price on December 17, 2020. The implied enterprise value is USD 2.8 billion (approximately EUR 2.3 billion), inclusive of BioTelemetry's cash and debt. The board of directors of BioTelemetry has approved the transaction and recommends the offer to its shareholders. The transaction is expected to be completed in the first quarter of 2021.

The acquisition of BioTelemetry is a strong fit with Philips' cardiac care portfolio, and its strategy to transform the delivery of care along the health continuum with integrated solutions. The combination of Philips' leading patient monitoring position in the hospital with BioTelemetry's leading cardiac diagnostics and monitoring position outside the hospital, will result in a global leader in patient care management solutions for the hospital and the home for cardiac and other patients. Philips' current portfolio includes real-time patient

Advancing digital health: FDA innovation during COVID-19

nature.com/articles/s41746-020-00371-7

Kushal Kadakia, Bakul Patel, Anand Shah

data regulation

Advancing digital health: FDA innovation during COVID-19

Download PDF

Digital health products have played an important role in the COVID-19 response, from supporting the remote monitoring of patients to enabling continuity in data collection for clinical trials. The U.S. Food and Drug Administration (FDA) has issued a number of temporary policies to support digital health innovation during the pandemic, such as guidance documents to expand the use of digital therapeutics for psychiatric disorders and medical devices for remote patient monitoring. In this article, we contextualize these policies to the agency's existing regulatory framework for digital health, outline key considerations for patients and health care providers, and identify implications for the future of digital health innovation.

The COVID-19 pandemic has accelerated the transition to digital health in the American health care system. For example, many clinical trial sponsors have adopted telehealth and remote patient monitoring technologies to enable continuity in data collection during the pandemic. Likewise, various mobile medical applications and software functions have been used to support public health surveillance, enable the dissemination of educational materials, and streamline communication for patients and providers. Furthermore, regulatory relief from the Centers for Medicare & Medicaid Services (CMS) has enabled clinicians to shift visits to virtual platforms to reduce infection risk to patients.

The Food and Drug Administration (FDA) has issued multiple temporary policies to support the uptake of these tools during the public health emergency[1]. These actions are an extension of the agency's longstanding commitment to advancing regulatory science for digital health, which was articulated in 2017 with the Digital Health Innovation Action Plan and solidified with the creation of a Digital Health Center of Excellence, which was launched in 2020[2,3]. In this article, we contextualize FDA policies to support digital health during the COVID-19 pandemic to the agency's existing risk-based approach to regulation, and preview the implications of these policies for the future of digital health innovation.

FDA's regulatory framework for digital health

When Congress provided FDA with the authority to regulate medical devices in 1976, medical technologies were largely analog[4]. Hardware-based devices differ significantly from software-based devices in terms of their design, development life cycle, and risk-benefit calculus. As innovators began to develop digital tools to reduce care fragmentation, promote personal

corporations
– Google

Verily brings in $700 million to support business expansion

mobihealthnews.com/news/verily-brings-700-million-support-business-expansion

December 18, 2020

Alphabet's life sciences and healthcare subsidiary Verily has raised $700 million in an investment round funded by its existing investors, including Alphabet, Silver Lake, Temasek, Ontario Teachers' Pension Plan and others.

WHAT IT DOES

Verily serves as Alphabet's research arm that develops tools and devices to collect, organize and activate health data. It also creates interventions to prevent and manage disease.

The company often partners with other health-focused organizations to bring these innovations to life at scale.

Past partnerships include a digitally driven diabetes-management tool called Onduo, developed with Sanofi. It also teamed up with digital health startup iRhythm on an initiative focused on creating screening, diagnosis and management tools for patients with atrial fibrillation.

WHAT IT'S FOR

chatbots

Memorial Health uses chatbots to boost patient experience, streamline workflows

healthcareitnews.com/news/memorial-health-uses-chatbots-boost-patient-experience-streamline-workflows

December 23, 2020

Memorial Medical Center, Springfield, Illinois

Memorial Health System, based in Springfield, Illinois, believes that one of the key challenges the healthcare industry faces today is finding ways to improve communication and engagement with patients. Healthcare may be a business, but it's ultimately about people, and one cannot expect to get anything done unless they have a way to successfully interact and engage with patients over the course of time in meaningful, lasting ways.

THE PROBLEM

Hospital-centric health systems are at risk of being commoditized in a value-based care world, said Jay Roszhart, president of the MHS ambulatory group at Memorial Health System.

"Historically, healthcare has relied on episodic, one-to-one interactions to deliver care, and that is no longer enough," he explained. "There's a lot of talk about consumerism in healthcare, and several big, successful consumer companies are leveraging their customer engagement pedigree in an effort to provide patients with a new healthcare alternative."

Six Tests for Physicians and Their Leaders for the Decade Ahead

catalyst.nejm.org/doi/full/10.1056/CAT.19.1045

trends ~ healthcare

Summary

In the years immediately ahead, physicians and their leaders must move to a new level of health care in which they reliably deliver the performance that society needs. To enable and ensure success, significant changes will be required. A set of six tests for physicians and their leaders focuses on these core considerations: putting patients first, creating super-teams, plunging into competition, reducing costs, embracing innovation, and grasping the nature of leadership.

For physicians and their leaders, the recent past has been difficult, and the decade ahead will be even more challenging. Already, they are under pressure for better outcomes and lower costs, and when financial downturns occur, those pressures will intensify. Physicians and their organizations will be tested on six issues that will determine which ones are most likely to succeed.

These six tests represent responses to health care's challenges made explicit during the last quarter century. First came the Balanced Budget Act of 1997, through which the federal government began to tap the brakes on health care spending. Then came the Institute of Medicine (IOM) reports of 1999 and 2001 (To Err is Human and Crossing the Quality Chasm, respectively), which made improvement in quality an imperative. After that came the Affordable Care Act (ACA) of 2010, which led to changes in payment while expanding coverage to at least 20 million previously uninsured Americans.

These cost, quality, and access challenges were driven in part by wondrous scientific progress, which has made medicine more powerful, but also more expensive and complex. New drugs, tests, and procedures enabled gains against many conditions (e.g., hepatitis C and some malignancies), but also heightened risks for disappointing quality. The result is that doctors sometimes feel like the waiters in the old joke about food at a mediocre resort — i.e., doctors are constantly given the message that their work isn't very good, it costs too much, and there isn't enough of it.

Nevertheless, real progress is underway in health care delivery, and today's physicians are less likely to resist change than in the past, and more likely to lead it. In 2002, for example, physicians at Cedars Sinai Medical Center in Los Angeles revolted as the hospital rolled out its computerized order entry system, forcing management to revert to paper systems.[1] But by 2015, Cedars Sinai had become a cutting-edge innovator, letting 87,000 patients add mobile data to their electronic health records; today, physicians there lead a range of information technology–linked start-ups.[2,3]

L

Making a Dent in the Trillion-Dollar Problem: Toward Zero Defects

catalyst.nejm.org/doi/full/10.1056/CAT.19.1064

healthcare
- policy

Summary

Health care harms too many patients, costs too much, and improves too slowly. Progress in improving value has been slow. Most efforts to eliminate defects in value have been piecemeal rather than systematic. In this article, the authors describe a framework for identifying defects in value and provide estimates for cost savings if these defects were to be eliminated. The authors then provide a framework for how health systems may work to systematically eliminate these defects in value. Finally, they provide an example of one academic health system that embarked on a journey to implement this framework and the initial results and lessons learned. In the current study, the authors found that: (1) the U.S. health system spends in excess of $1.3 trillion per year on suboptimal behavior; and (2) their organization was able to reduce the annual per-member-per-year cost by 9% over the course of 12 months by reducing specific defects in care. Although it is early in the journey and the framework is only 25% deployed, the authors believe that this model offers a hopeful path forward for improving value.

The Need for a Health Care Paradigm Shift

Since the passage of the Affordable Care Act (ACA) and the rise of value-based care, there has been a heightened awareness of the need to measure and reduce low-value care in the United States health system. In 2010, the Institute of Medicine and several other organizations estimated that the total cost of low-value and unnecessary care was approximately $500 billion each year, nearly one-fifth of all medical expenditures.[1-4] The inefficient care and expenditures were noted to be the direct results of suboptimal clinical decisions — decisions that are perpetuated, to a large extent, by the invisibility of defects in care and by a lack of alignment in incentives for patients, clinicians, and organizations delivering care. In today's prevailing health system, patients face co-payments that dissuade necessary care, physicians are systematically incentivized to provide more episodic — rather than better coordinated — care, and most health systems have few incentives to provide high-value, coordinated care when juxtaposed against the incentives to admit more patients and to perform more procedures.[5]

In recognition of this misalignment of incentives and the need for professional organizations to engage, there has been a series of attempts to reduce low-value care and better align incentives. In 2010, the American Board of Internal Medicine Foundation introduced its Choosing Wisely campaign, which uses lists recommended by specialty societies to provide guidance to clinicians on diagnostic tests and procedures that should never be performed.

A Systems Approach to Addressing Covid-19 Health Inequities

catalyst.nejm.org/doi/full/10.1056/CAT.20.0374

Article

The development of a dashboard to track racial, ethnic, and language metrics as they are related to patients with coronavirus within the community and within the health care organization is an essential tool for discovering, addressing, and resolving health disparities.

By

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NEJM Catalyst Innovations in Care Delivery 2020; 01

DOI:https://doi.org/10.1056/CAT.20.0374

Summary

Racial and ethnic minorities are dying from Covid-19 at alarmingly high rates, which demands immediate action. Health system leaders cannot allow other priorities to interfere with a commitment to address health inequities. Vanderbilt University Medical Center (VUMC) has embedded strategies to mitigate health inequities in its Covid-19 Command Center. A key strategy is the creation of interactive dashboards, which are reviewed daily and allow disaggregation by race, ethnicity, language, and ZIP Code. Of the first 45,954 patients tested for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) at VUMC, 2,310 had limited English proficiency (LEP). The positivity rate for patients with LEP was 26% compared with 6% for patients with English as a primary language. In addition to alerting local and state health departments of these higher rates, we created multilingual resources, assessed our interpreter services capacity, and engaged trusted community organizations. Early lessons learned at VUMC may help others implement a systems approach and immediately begin addressing Covid-19 health equity.

Inequities in the burden of Covid-19 have been uncovered among vulnerable populations across the world[1] and are particularly striking in racial and ethnic minorities in the United States.[2] In New York City, African Americans and Latinos diagnosed with Covid-19 had mortality rates that were 1.6 to 2 times higher than those of whites.[3] Across the United States, Covid-19 infections are threefold higher and mortality rates are sixfold higher in

UPMC links Xealth education content with Epic, boosts patient engagement

healthcareitnews.com/news/upmc-links-xealth-education-content-epic-boosts-patient-engagement

October 6, 2020

digihealth – patients

Global Edition
Patient Engagement

The technology has been used across the health system by thousands of providers to make 1.1 million digital health prescriptions to patients. More than 40% of those patients have engaged with at least one piece of content.

UPMC Magee-Womens Hospital.

Given the size of Pittsburgh-based UPMC, it had become increasingly challenging to effectively communicate consistent education messages, particularly around the topic of childbirth, to all patients across the health system.

THE PROBLEM

By handing patients a large folder of printed materials that were not necessarily targeted to their needs, UPMC ran the risk of driving them away from approved information and onto the Internet, where the information they find may not be accurate.

HIMSS20 Digital

Exosomal miR-3180-3p inhibits proliferation and metastasis of non-small cell lung cancer by downregulating FOXP4

December 22, 2020

This article was originally published here

Exosomes
-competition

Thorac Cancer. 2020 Dec 21. doi: 10.1111/1759-7714.13759. Online ahead of print.

ABSTRACT

BACKGROUND: Non-small cell lung cancer (NSCLC) is one of the most malignant cancers worldwide and its pathogenesis is not completely clear. In this study, we explored the functions and mechanisms of exosomes transferring miR-3180-3p in NSCLC progression.

METHODS: The expression levels of miR-3180-3p in NSCLC tissues and paracarcinoma tissues was obtained from the GEO database (GEO: GSE53882). Exosomes derived from A549 cells were identified. Proliferation, migration and invasion were measured after treatment with exosomal miR-3180-3p or transfection using miR-3180-3p mimics. The relationship between miR-3180-3p and forkhead box P4 (FOXP4) was predicted using a bioinformatic tool and measured using a dual-luciferase reporter gene assay and western blotting. Finally, a mouse xenograft model of NSCLC cells was established to verify the function of exosomal miR-3180-3p in vivo.

RESULTS: We found that miR-3180-3p decreased in both NSCLC cell lines and patient tissues. Overexpression of miR-3180-3p or treatment with exosomal miR-3180-3p significantly suppressed cell proliferation and metastasis in NSCLC cell lines. Subsequently, we found miR-3180-3p downregulated FOXP4 protein expression levels. Furthermore, the volumes and weights of nude mouse tumors expressing exosomal miR-3180-3p were significantly reduced.

CONCLUSIONS: Exosomal miR-3180-3p suppresses NSCLC progression by downregulating FOXP4 expression.

KEY POINTS: SIGNIFICANT FINDINGS OF THE STUDY: We found that exosomal miR-3180-3p suppressed NSCLC progression and also identified a miR-3180-3p target gene. These findings provide a foundation to determine innovative therapeutic strategies.

WHAT THIS STUDY ADDS: This study contributes to research investigating exosomal containing miRNAs.

PMID: 33350095 DOI: 10.1111/1759-7714.13759

coronavirus
-Dx

Fierce Medtech's Top 10 stories of 2020: COVID testing's ups and downs

fiercebiotech.com/medtech/fierce-medtech-s-top-10-stories-2020-covid-testing-s-ups-and-downs

Our most-read stories of the year all tap into a single idea: How can we learn as much as we can about this pandemic threat? (Getty Images)

In a typical year, I'd compile our annual roundup of top stories while searching for photos of gold confetti and festive ribbons—champagne, maybe, or some fireworks—while the tune of "Auld Lang Syne" runs through my head, hoping to evoke an air of happy celebration and offer, in our small way, a salute to the accomplishments of the medtech industry during our last trip around the sun.

This year? Not so much.

But despite everything 2020 and COVID-19 brought us and took away—with immeasurable losses of life and ways of living—accomplishments abound. This is no time at all for old acquaintances to be forgot, and never bringing them to mind would only compound tragedy.

resilience
- workplace

OSHA's Role in Combating the COVID-19 Pandemic

theregreview.org/2020/11/02/mendeloff-osha-role-combating-covid-19-pandemic

John Mendeloff

November 2, 2020

Font Size:
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More information sharing and enforcement by OSHA and state agencies could better protect workers from COVID-19.

Workplaces are a significant source of infection for COVID-19, as shown not only by the illnesses of health care workers, but also by the tens of thousands of positive cases and roughly 200 deaths at meatpacking plants. The Occupational Safety and Health Administration (OSHA) has responsibilities for keeping employees safe at work, but it has played a fairly limited role in addressing COVID-19.

Some critics have called for a more aggressive enforcement role from OSHA. I agree that some increase in enforcement, including a new standard for infectious diseases, would be beneficial. But in addition, it is important to improve our ability to identify cases of infection where the workplace is a likely place of transmission. The objective should be to facilitate employers' and employees' efforts in identifying infected individuals. In addition to aiding in identifying cases, employers can and should aid in preventing transmission.

Before discussing what role OSHA should play, it bears noting what its role has been to date during the pandemic.

The Regulatory Review
A Publication of the Penn Program on Regulation

risk
- climate

Opinion | Business | Nov 4, 2020

Climate Change Is a Systemic Financial Risk

Veena Ramani

Corporate counsel should heed regulators' warnings that climate change is a risk to the financial industry.

The U.S. Commodity Futures Trading Commission (CFTC) issued a report last month on the impact of climate change that landed like a thunderbolt.

cyber
-game

Could Gamers Form The Military's Future?

forces.net/news/could-gamers-form-militarys-future

Tom Sables 18th December 2020 at 4:48pm

Gaming

Forces News sent a reporter inside the gaming world to meet potential recruits with a passion for defence.

Gaming has become a go-to leisure activity for many in recent years, with the coronavirus lockdown only boosting online numbers further.

Military personnel, all coming from a 'civvy street' of their own, have been no exception – logging on while off-duty more and more as games develop.

However, official strategy is also taking notice of the virtual phenomenon.

The British military has continued to step up its engagement with the general public at gaming festivals and online.

Competing, interacting and informing, personnel have appeared at massive, open events such as Insomnia, training on base to raise their profile.

For gamers, the UK Armed Forces offers the chance to operate and develop increasingly futuristic systems – getting hands-on with the kit they have only seen through screens.

But what does the military gain from this new wave of recruits, and how can they turn what a recruitment campaign labelled 'binge gamers' into the personnel of the future?

Forces News spoke to Major Tim Elliott, Head of Army E-sports.

Royal United Services Institute
for Defence and Security Studies

1) gray
-reviews

BRIEFING PAPER

The Case for Joint Military–Industry Greyzone Exercises

2) ~~Gi~~ resilience
- review

Elisabeth Braw

shipping altered the economic fabric of so much of the globe, especially in and around those cities fortunate enough to be located near deep-water ports and along the main commercial routes. When larger and faster steamships became the norm in the late 19th century, during the second great spurt of industrialisation, the world really did change in many ways, though a great deal of humanity found itself trailing in the wake of the West, making 'catch-up' much more difficult.

Unlocking the World is a fine, important and in many ways original book, beautifully produced. The notes and further reading list are all great boons for the reader. But Darwin's story and analysis simply end too abruptly. Of course, the catastrophe of 1914 – a blunt reminder that the Edwardian era was not only one of globalisation but also one of seething nationalisms, armaments races and reckless general staffs – came as a great shock to the prosperous global trading system, reminiscent of the aeroplane crashing into a tea party in George Bernard Shaw's 1910 play *Misalliance*. Yet there is a need for a longer dissection of how that very prosperous world came apart. The booming economy of the 19th century was only able to come into being, after all, because the great powers took a long break from the costly wars that consumed them for much of the 18th century. What Darwin describes so well was a special and rather precious time in international history, and one that was unlikely to have gone on forever. That will be a sobering thought, as he himself points out, for anyone who might be inclined to rejoice at the great globalised boom of the past sixty or so years of our human story.

1) CAS – decision 2) IC

DAVID ANDERSON

The Spy Who Taught Me

Behind the Enigma: The Authorised History of GCHQ, Britain's Secret Cyber-Intelligence Agency
By John Ferris
(Bloomsbury 848pp £30)

How Spies Think: Ten Lessons in Intelligence
By David Omand
(Viking 352pp £20)

British officialdom was not always attracted to eavesdropping. Viscount Falkland, Charles I's secretary of state at the start of the Civil War, thought the opening of the letters of the king's enemies 'such a violation of the law of nature that no qualification by office could justify a single person in the trespass' (though, as his friend the Earl of Clarendon recorded, he 'found means to shift it from himself'). In the late Victorian period, secret intelligence was collected only for specific purposes, usually concerned with imperial security; the messages of the great European powers were neither intercepted nor decrypted.

All that changed irreversibly with the approach of the First World War and the birth of modern signals intelligence (sigint), the result of what the Canadian academic John Ferris describes in his official history of GCHQ as 'a collision between electronics, radio, data processing and cryptology'. The interception and decoding of the Zimmermann telegram, a German offer of a military alliance to Mexico that promised the restoration of territory annexed by the United States, helped unify American opinion in favour of entering the war. By 1918 British sigint employed 9,500 people, ran around a hundred intercept stations and had developed techniques – notably traffic analysis (assessment not of the content of communications but of their patterns and external features) – that remain central to intelligence work today in fields ranging from counterterrorism to cyber-defence.

Founded in 1919 as the Government Code and Cypher School, GCHQ is the largest of the UK's secret intelligence agencies and the major collector of foreign intelligence. Functioning symbiotically with the US National Security Agency (NSA), it is at the heart of an intelligence relationship unique in the world. Through most of its history, GCHQ has functioned in almost total secrecy. As Richard Aldrich noted in his unauthorised history of GCHQ, the 2004 Butler Review, which examined the intelligence on weapons of mass destruction in Iraq, contains not a single substantive reference to its work.

In recent decades, some daylight has been let in. GCHQ's existence was publicly avowed in 1982 and the organisation's operations were given a statutory basis in 1994. Legal pressures, particularly from Europe, have forced it to account to the courts for activities that, in an interconnected world, can no longer be dismissed as being concerned only with foreign threats. Intelligence chiefs concluded after 2013 that the damaging reactions to Edward Snowden's disclosures could have been mitigated if more information had been in the public domain. The result has been tighter oversight of GCHQ's activities, its assumption of a national role in promoting cyber-security, outreach programmes (inspired by Israel) to teenage 'cyberists', the sponsoring of a popular exhibition at London's Science Museum and now this authorised history, which appears a decade after Christopher Andrew and Keith Jeffery published equivalents for MI5 and MI6.

Disclosure, however, has its limits. Ferris has had access to diplomatic communications only up to 1945 and for the years between 1945 and 1992 he has seen the records relating to some campaigns but not others. For the period since 1992, he has been largely restricted to material in the public domain; those curious about GCHQ's role in the Afghan and Iraq wars must remain patient for years or decades longer. When he was asked to write the book, Ferris was told he could not discuss 'any technicalities of collection which remained current'. Accordingly,

Spies, Lies, and Algorithms

foreignaffairs.com/articles/2019-04-16/spies-lies-and-algorithms

November 13, 2020

Cracking the code: at CIA headquarters, Langley, Virginia, June 2010
Drew Angerer / THE NEW YORK TIMES / REDUX

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For U.S. intelligence agencies, the twenty-first century began with a shock, when 19 al Qaeda operatives hijacked four planes and perpetrated the deadliest attack ever on U.S. soil. In the wake of the attack, the intelligence community mobilized with one overriding goal: preventing another 9/11. The CIA, the National Security Agency, and the 15 other components of the U.S. intelligence community restructured, reformed, and retooled. Congress appropriated billions of dollars to support the transformation.

coronavirus reservoir

Susceptibility of Domestic Swine to Experimental Infection with Severe Acute Respiratory Syndrome Coronavirus 2

wwwnc.cdc.gov/eid/article/27/1/20-3399_article

Volume 27, Number 1—January 2021

Research

Article Metrics

Metric Details

Brad S. Pickering ✉ , Greg Smith, Mathieu M. Pinette, Carissa Embury-Hyatt, Estella Moffat, Peter Marszal, and Charles E. Lewis

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Suggested citation for this article

Abstract

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the agent that causes coronavirus disease, has been shown to infect several species. The role of domestic livestock and associated risks for humans in close contact with food production animals remains unknown for many species. Determining the susceptibility of pigs to SARS-CoV-2 is critical to a One Health approach to manage potential risk for zoonotic transmission. We found that pigs are susceptible to SARS-CoV-2 after oronasal inoculation. Among 16 animals, we detected viral RNA in group oral fluids and in nasal wash from 2 pigs, but live virus was isolated from only 1 pig. Antibodies also were detected in only 2 animals at 11 and 13 days postinoculation but were detected in oral fluid samples at 6 days postinoculation, indicating antibody secretion. These data highlight the need for additional livestock assessment to determine the potential role of domestic animals in the SARS-CoV-2 pandemic.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease (COVID-19) in humans; symptoms can range from asymptomatic to mild or severe, including severe respiratory distress and sometimes death (*1*). Rapidly spreading, the novel

coronavirus -pool

Ask The Expert

One Lab's Experience With Pooled SARS-CoV-2 Testing

EXPERT
Nanette West, MBA, MT (ASCP)

Why did your lab start pooling SARS-CoV-2 specimens?

A Like all other laboratories, when SARS-CoV-2 first reached the U.S. we found ourselves needing to ramp up testing faster than the supply chain for reagent and ancillary supplies could support. Every week was a struggle to ensure that we did not run out of reagent, and we were forced to make difficult decisions about which patient samples we would run and which ones we would save until our next reagent shipment. This was what led us to consider pooled testing.

When we initially presented the pooling concept to our medical directors, they rejected the idea. As supply shortages continued, though, everyone realized that we would either have to restrict SARS-CoV-2 testing or move forward with pooling.

How does your pooling process work?

First, we create a mock accession number and label the pooled test tube, then we manually pipette four 400 µL patient samples into the accession tube and vortex to ensure adequate mixing. We use a 10 x 5 rack so that we can rack the individual specimens directly behind the mock/pooled accession tube, and specimens remain in the rack until we have verified all results. After we pool the specimens, we then load the pooled accession specimens onto the polymerase chain reaction (PCR) platform, where they are treated as individual specimens.

What challenges have you experienced with pooled testing?

Implementing and sustaining pooled testing has presented our staff with numerous challenges. For starters, we are a mid-volume lab with automation and very few processes offline from our laboratory information system (LIS) or middleware. To implement pooling, we therefore had to create a process that gives each pool specimen a unique barcode identifier so that the PCR analyzer can associate results with individual patients within the pool. This enables us to break apart the pool and rerun individual samples in the event of a positive pool, or to result negative pools as individual patients.

Pooling has increased our handling of SARS-CoV-2 specimens, which in turn has increased the staff's exposure risk. Instead of processing specimens once and loading them onto the analyzer, we are now processing and handling specimens multiple times. Storage has also become an issue as all pools are stored along with individual specimens until the test results are cleared.

Resulting pools is an offline process and requires the laboratory to manually enter all results. This has added to our turnaround time as it requires intervention instead of our LIS releasing results once each run is validated.

Unanticipated delays occur because we have to hold off on testing until we have the 94 specimens needed to run a full plate. This is particularly problematic on weekends, as our collection station is open on Saturdays but closed on Sundays.

Additionally, as the positivity rate continues to increase in our community, pooling is becoming less efficient, and it's becoming more difficult for laboratory staff to ensure that known positive samples aren't included in pools.

What is the clinical impact of pooling?

Our validation of pooled testing did not show a significant loss of sensitivity or specificity. Pooled cycle counts were also within acceptable limits compared to individual cycle counts, which indicates that it is unlikely that pooling is generating false negatives.

Most of the clinical impact we've seen is due to the extended turnaround times caused by having to retest individual samples from positive pools. With that said, we've saved more than 40% of our reagents by pooling, and it continues to be worth the extra effort to test as many patients as we can.

Nanette West, MBA, MT (ASCP), is the system director of laboratory operations at TMC in Kansas City, Missouri.
EMAIL: nan.west@tmcmed.org

The author wishes to acknowledge and thank her Truman Medical Center (TMC) colleagues Kamani Lankachandra, MD, medical director of laboratory operations; Jeffrey Kelleher, MBA, MLT (ASCP), core laboratory supervisor; and Debra Engblom, MT (ASCP), quality assurance manager, for their support with developing responses to these questions.