Big Data & AI Vision 2020

Technology Surveillance

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1. INTRODUCCIÓN

La vigilancia tecnológica es una actividad fundamental para la innovación y la competitividad. No sólo permite detectar oportunidades y tendencias emergentes, sino que es también una herramienta para valorar la tecnología que se está desarrollando.

En el BDCoE la vigilancia tecnológica se lleva a cabo de una manera regular, a partir de fuentes calificadas, no solo en el campo de los datos y la Inteligencia Artificial sino también en un amplio espectro de disciplinas y ámbitos de aplicación en donde la analítica de datos y la IA pueden ser de gran aporte a la innovación. De esta manera se da apoyo a la creación de nuevas aplicaciones y a la entrada a otros sectores.

La bibliografía recogida se ha clasificado en las doce áreas temáticas siguientes:

1) Personas y Sociedad
2) Ciudades
3) Salud
4) Medio Ambiente
5) Confianza, privacidad y seguridad
6) Negocios y Economía
7) Automatización
8) Computación cuántica
9) Interfaces
10) Inteligencia Artificial
11) Big Data
12) Tendencias futuras

La primera temática incide de forma general en las personas y en el desarrollo de la sociedad y de la 2 a la 5, son ámbitos de aplicación de la primera. Los temas del 7 al 11, se centran en los avances sobre diferentes disciplinas tecnológicas y el último se refiere a tendencias tecnológicas aparecidas en el 2020 y analizadas desde fuentes diversas.

En el primer tema, se hace evidente la preocupación acerca del impacto de la economía digital en la sociedad. En particular destacamos 2 grandes preocupaciones: en primer lugar, hasta dónde llegará la tecnología y cuál será el impacto a nivel de empleo de sustituir procesos manuales por procesos automáticos, y en segundo lugar, muy relacionado con el tema 4, ¿llegará un punto en el que todos estaremos “vigilados” debido a la constante recogida de datos de nuestros actos y características?

El IoT, el despliegue del 5G y la inteligencia artificial hacen posible la creación de nuevas aplicaciones y productos. Es así como vemos cada vez más, en el ámbito de las ciudades inteligentes (tema 2), respuestas a las demandas de la ciudad en términos de seguridad, energía, movilidad, desarrollo económico y salud.

Precisamente respecto a la salud (tema 3), se sigue avanzando en el camino de la hiper-personalización de los tratamientos y en la asistencia remota y oportuna, entre otros campos. Esto a su vez plantea problemas éticos que han de ser resueltos ya que implica la recogida y/o análisis de datos sensibles de pacientes de forma masiva.

El medio ambiente (tema 4) es otra de las áreas en las que la analítica de datos y la inteligencia artificial han demostrado tener un gran potencial en la solución de grandes problemas en este ámbito, pero a su vez plantea problemas ambientales en relación a su uso. Temas de gran impacto como la agricultura sostenible, el ahorro y re-utilización de recursos y la contaminación, entre otros, han sido y continúan siendo objeto de análisis, de mejoras significativas y de aplicación de tecnologías innovadoras basadas en la analítica de datos, el IoT y la IA. La contrapartida a estas mejoras es el consumo de energía y las emisiones de dióxido de carbono que generan los centros de datos.

La confianza en los contenidos y aplicaciones, la seguridad de las conexiones y la privacidad de los datos (tema 5) han sido uno de los temas de preocupación prioritarios en esta era de hiper-conectividad creciente. Por un lado, están los contenidos falsos, creados por algoritmos cada vez más eficientes e inteligentes (deepfakes) que hacen muy difícil diferenciarlos de los contenidos reales y que pueden tener un gran impacto en la sociedad. A esto se suma la desconfianza que pueden llegar a generar los sistemas inteligentes de apoyo a la toma de decisiones. En este sentido, se trabaja cada vez más en lo que se denomina en inglés “explainable AI”, es decir, en herramientas que ayuden a explicar/interpretar los resultados de algoritmos basados en ML. También se trabaja en la identificación de sesgos en los datos de entrenamiento que puedan originar resultados discriminatorios. En cuanto a la privacidad de los datos, hay un claro movimiento en favor de la transparencia en el manejo y obtención de los datos y en reivindicar a las personas como propietarias de sus datos. Se reclaman formas sencillas para que puedan tomar el control de la gestión de sus datos y decidir con qué finalidades pueden usarse.

La economía de la digitalización sigue creciendo aceleradamente y penetrando el mundo de los negocios (tema 6) lo que a su vez va transformando nuestro modo de vida. De la bibliografía recogida destacan 5 sectores sensibles que pueden sufrir transformaciones disruptivas: salud, construcción, bienes raíces, estado y gobierno, y finanzas y seguros. En estos y otros sectores, la automatización de procesos (tema 7) se apoya cada vez más en la robótica, no solo a nivel de robots físicos sino también robots cognitivos capaces de llevar a cabo trabajos de gestión. Fuera del sector industrial, se trabaja especialmente en robots dedicados al envío de mercancías, donde ya hay varios prototipos que están siendo probados.

Llama la atención la importancia creciente de la computación cuántica (tema 8) a partir de la aparición de las primeras versiones de ordenadores cuánticos (IBM y Google). Ya comienzan a desplegarse aplicaciones basadas en computación cuántica, especialmente en soluciones que implican la realización de simulaciones complejas, y en optimizaciones discretas en el área aeroespacial y automoción.

Las interfaces (tema 9) continúan avanzando en torno a la comunicación fácil, efectiva y con información “a la mano”. Es así como han aparecido dispositivos de comunicación más sofisticados, multicanales y con tecnología sensórica, por el lado del hardware, y asistentes personales más funcionales, “humanizados” y adaptados al usuario en base al aprendizaje de sus características y hábitos.

Los dos penúltimos temas (10 y 11) son mayoritariamente un compendio de diversas opiniones acerca de las capacidades y limitaciones de la inteligencia artificial y el big data desde el punto de vista tecnológico. Con respecto a la inteligencia artificial, se destaca el número de artículos que intentan ver más allá del deep learning, identificando sus limitaciones (procesos opacos, no generales, incapacidad para aprender conceptos abstractos, incapacidad de establecer relaciones de causalidad, etc) e identificando retos y caminos de investigación futura, donde el de mayor consenso es el de la creación de modelos híbridos done participe también la manipulación simbólica. En relación al Big Data, las opiniones giran alrededor de la necesidad de aumentar la capacidad de almacenamiento y la velocidad de respuesta de la analítica de datos.

Finalmente, el último tema de la bibliografía (12) recoge diferentes artículos acerca de cuáles serán los retos tecnológicos en el 2020. La mayor parte de estas opiniones coinciden en que AI y big data, cloud computing y ciberseguridad se mantendrán en el “top” de las noticias tecnológicas mientras que el 5G, el edge computing, la computación cuántica, y la internet ética irán en continuo crecimiento en el 2020. Esto se reflejará en aplicaciones innovadoras en diferentes campos: tecnologías de gran impacto para la asistencia médica, robots que no solo aumentad la capacidad humana a nivel de producción industrial sino también en tareas cognitivas, crecimiento de fintechs, nuevos objetos autónomos, gestión automática y más inteligente de recursos naturales, modelos de inteligencia artificial más transparentes, ciberseguridad predictiva, y tanto tecnologías como normativas orientadas a la ética en internet y a la confiabilidad en los contenidos.

2. People & Society

2.1. Power of the individual

Digitalist: Trends based on the Digitalization of Society
(https://www.digitalistmag.com/cio-knowledge/2019/09/17/trends-based-on-digitalization-of-society-06200592)

(Sept 19) It's a common opinion that the significance of people will decrease as technology advances, with some even predicting we'll be replaced by robots in most aspects of life. I'm going to start by saying that this just isn't true, and that people will be at the forefront of the digitalization of society. This brings me to the first society trend listed by NTT Data in its study: the power of the individual.

Businesses rely on humans for success, either to work there or to buy their goods and services. The role of individuals is more important than ever in the digital age. Social media enables companies to reach a much wider range of potential customers. However, this also increases the competition. Companies must understand what consumers want and inform them. This even branches out to hyper-personalized products that are tailored to a customer's wishes. The power really is in the hands of the individual in the digital economy, and businesses must understand purchasing trends and behavior.

2.2. Decentralized collaboration

Digitalist: Trends based on the Digitalization of Society
(https://www.digitalistmag.com/cio-knowledge/2019/09/17/trends-based-on-digitalization-of-society-06200592)

(Sept 19) The conventional, vertical hierarchy is likely to become a thing of the past. The networked world enables higher levels of automation and replaces traditional models for numerous tasks, such as manufacturing, shopping, and transportation. So how does this all work? Basically, more devices can now be connected to the Internet in what is known as the Internet of Things. This creates a network whereby everything within this network can interact. An example of this would be a smart home that runs itself. This includes lighting, locks, appliances, and even power consumption. Humanity reaps the rewards while having to perform fewer tasks.

Alongside the Internet of Things, blockchain has an important role to play in decentralized collaboration. A prime example of this is cryptocurrency. Not that long ago, almost all payments were completed with cash or checks. Now, a huge amount of shopping is done online, some of it without official forms of currency, such as bitcoin. Blockchain technology enables

payments and refunds to be completed without the need for third-party interaction – streamlining and accelerating an important everyday task.

2.3. Detecting unbalances in society through data mining

https://www.technologyreview.com/s/614296/data-mining-shows-black-people-waited-longer-than-white-to-vote-in-2016/

(Sept 19) Data mining shows black people waited longer than white people to vote in 2016 The result, obtained from mobile-phone records, raises an obvious question–why?

2.4. Using AI as a tool for social justice

https://www.technowize.com/using-ai-as-a-tool-for-social-justice/

(Sept 19) Technology has played huge roles in global development, mostly in reducing human efforts and addressing commercial challenges. But these impacts are not felt in the most difficult challenges facing humanity. Though artificial intelligence offers the opportunities to remodel predictive human behaviors and structures challenging social justice, a few challenges have kept this from not happening.

2.5. Will the Internet of Things Ever Rule the World?

https://readwrite.com/2019/10/17/will-the-internet-of-things-ever-rule-the-world/

(Oct 19) Every possible entity, whether it is a machine, a satellite, an object that performs their tasks independently using the internet as a medium, has to transfer relevant data. IoT has been the latest leap of faith made by humans. We are basically allotting essential responsibilities to intelligent machines. But, will the internet of things (IoT) ever rule the world?

2.6. Big Brother Meets Big Pharma: Harvesting Biometrics Of Everyone

https://www.zerohedge.com/health/big-brother-meets-big-pharma-harvesting-biometrics-everyone

(Oct-19) It's all happening, just as predicted. Big Pharma is officially partnering with the tech industry to pair "immunization" with digital biometrics, meaning humans will soon be microchipped, tracked, and ultimately controlled through a global identification matrix.
Similar to how cattle are marked with ear tags, this globalist alliance wants all humans to be "vaccinated" with digital tracking chips that will create a seamless monitoring system for the New World Order to manage the populations of the world with ease.

"We are implementing a forward-looking approach to digital identity that gives individuals control over their own personal information, while still building off existing systems and programs," says Anir Chowdhury, a policy advisor at a2i, the Bangladesh government's "Access to Information Program."

"The government of Bangladesh recognizes that the design of digital identity systems carries far-reaching implications for individuals' access to services and livelihoods, and we are eager to pioneer this approach," he adds.

While the ID2020 program's testing grounds are primarily in the Third World, the group says it's also now working with governments here in the United States to start microchipping people through vaccination.

In Austin, Texas, for example, the homeless population is now being exploited as a collective guinea pig for ID2020's microchip vaccination program, which the group claims will help to "empower" homeless people by supposedly giving them "control" over their personal identity data.

"The City of Austin, ID2020, and several other partners are working together with homeless people and the service providers who engage with them to develop a blockchain-enabled digital identity platform called MyPass to empower homeless people with their own identity data," writes Chris Burt for BiometricUpdate.com.

2.7. How data science could save 6 million lives from preventable death by 2030

https://thenextweb.com/syndication/2019/11/03/how-data-science-could-save-6-million-lives-from-preventable-death-by-2030/

(Nov 19) An initiative that will use digital technologies such as artificial intelligence has been launched to empower community health workers, promising to help save the lives of at least six million children and women in ten countries by 2030.

2.8. Surveillance on steroids: How A.I. is making Big Brother bigger and brainier

https://www.digitaltrends.com/cool-tech/ai-taking-facial-recognition-next-level/

(Nov 19) It's no big secret that we live in a surveillance state. The average American is caught on CCTV camera an estimated 75 times a day. Meanwhile an average Londoner, the world's most photographed person, is snapped on public and private security cameras an estimated 300 times every 24 hours.

2.9. Security robots are mobile surveillance devices, not human replacements

https://www.theverge.com/2019/11/14/20964584/knightscope-security-robot-guards-surveillance-devices-facial-recognition-numberplate-mobile-phone

(Nov 19) They're scooping up data, from facial scans to license plates
Security robots are slowly becoming a more common sight in malls, offices, and public spaces. But while these bots are often presented as replacements for human security guards — friendly robots on patrol — they're collecting far more data than humans could, suggesting they're more like mobile surveillance machines than conventional guards.

3. Cities

3.1. Smart Cities: The Future Of Urban Development

https://www.forbes.com/sites/jamesellsmoor/2019/05/19/smart-cities-the-future-of-urban-development/#289bb2fa2f90

(May 19) As the world becomes increasingly interconnected and technology-dependent, a new wave of smart applications is changing how we approach everyday activities. Utility appliances such as intelligent fridges (yes, you read that right), personal assistants like Amazon's Alexa or smart home security applications create opportunities for more efficient living. While the ideas of “Smart Cities” has been proposed as the future of urbanism, the question remains: how do we connect this new technology for the ultimately "efficient" society?

3.2. Governments Look To "Smart Islands" For High Tech And Low Carbon Solutions

https://www.forbes.com/sites/jamesellsmoor/2019/05/13/governments-look-to-smart-islands-for-high-tech-and-low-carbon-solutions/#382f92eb5922

(May 19) While cities are often seen as centers of innovation, a growing number of islands are quietly leading the way in smart technology. Islands worldwide are positioning themselves as incubators as they work towards becoming self-sufficient & reducing carbon footprints, leading to the adoption of new smart technology . Their growth has the potential to provide replicable models for larger areas, meaning many islands are becoming blueprints for the future development for the rest of the world, while themselves transforming into sustainable communities for the benefit of the local population.

3.3. Surveillance at the Heart of Smart Cities

https://readwrite.com/2019/08/31/surveillance-at-the-heart-of-smart-cities/

(Aug 19) Today’s cities are living entities. They develop, grow and become more complex over time. Yet, many of their most pressing issues, such as the need for utility improvements and monitoring crime, remain the same. Like never before, city officials have the capabilities to implement analytics technology. But surveillance will be at the heart of smart cities.

These technologies will help with a myriad of everyday city demands, in addition to more intricate challenges pertaining to security, healthcare, mobility, energy and economic development.

3.4. Smart Cities and Digital Innovation: a guide to the future.

https://bmilab.com/blog/2019/9/13/smart-cities-and-digital-innovation-a-guide-to-the-future

(Sep 10) As the digital economy grows and matures, the “smart cities” movement is gaining momentum. For many people it represents the promise of high tech cities, with autonomous cars rolling the streets, drones delivering food, and connected devices everywhere helping city dwellers to perform a myriad of activities.

However, this representation doesn’t convey the complexity of the field, where many issues (such as economy, social impact, environmental sustainability, and democratic participation) are intertwined. There is much more to Smart Cities. In his latest book “Smart Cities: Introducing Digital Innovation to Cities”, Oliver Gassmann, together with Jonas Böhm and Maximilian Palmié, delivers a comprehensive framework to navigate Smart Cities in all its complexity.

3.5. Smart Cities Will Need to Put People First – Not Technology – in Order to Survive

https://interestingengineering.com/smart-cities-will-need-to-put-people-first-not-technology-in-order-to-survive

(Oct 19) Smart cities are the future, but as modern infrastructure advances, it's finding itself at a crossroads with the actual people that live there.

Modern cities are facing a wealth of problems, from climate change to housing costs to traffic to unemployment. Historically these issues have been tackled using politics and community incentives, but now, they're being tackled with new smart city tech. Things like ride-sharing or home-sharing, connected public transport, et cetera.

4. Health

4.1. Data from health apps offers opportunities and obstacles to researchers

https://www.theverge.com/2019/7/3/20681254/data-health-apps-clue-period-tracking-sleep-fitness-research

(Jul 19) Tons of information just waiting to be analyzed.
Researchers are eager to tap into the steadily expanding pool of health information collected from users by products like Fitbit, Clue, and the Apple Watch. But while these datasets could be a scientific treasure trove for scientists, they also pose logistical and ethical challenges that need to be addressed.

4.2. Intelligent plasmonics

Digitalist: The Staggering Impact Of AI In Current And Future Healthcare
(https://www.digitalistmag.com/digital-economy/2019/09/17/staggering-impact-of-ai-in-current-future-healthcare-06200631)

(Sept 19) In simple terms, plasmonics is the study of the phenomenon when free electrons at the interface between a metal and a dielectric material (like air or glass) interact with electromagnetic oscillations in specific conditions and generate particles called plasmons. When AI is applied to these surface plasmons, the results can help detect and treat cancer and do in vitro studies of neuron cells. This technology also holds promise in the biomedicine and molecular diagnostics fields. Electroceuticals

4.3. Personalized treatment and medicines

Digitalist: The Staggering Impact Of AI In Current And Future Healthcare
(https://www.digitalistmag.com/digital-economy/2019/09/17/staggering-impact-of-ai-in-current-future-healthcare-06200631)

Implantable bioelectronics

(Sept 19) Pacemakers and cochlear implants have become essential technologies for improving many people's health and function. Electroceuticals or bioelectronics are implantable devices that can be placed into the appropriate nerve to alter the signals sent to

the brain and other organs of the body to treat disease. AI-based signal processing and solutions can ensure more accurate and effective insights into neural simulation.
Providing breakthrough solutions to diseases such as epilepsy, asthma, gastroparesis, and several cardiac disorders is not far away, as AI-fortified electroceuticals become a preferred and reliable alternative to pharmaceuticals…

Genomics

(Sept 19) Precision medicine, as it is popularly known, is tailor-made, focused care for individuals and small groups based on certain key traits, the genetic code, and other data. For example, different patients receive different treatments for a certain type of cancer based on their subtype.

However, according to Dr. Bertalan Meskó, medical futurist and one of the world's leading biotech thinkers, personalized medicine has no future without AI. Unless AI is utilized in analysis, prediction, and prescription, most of the exorbitant volume of patient genome data we have will remain unmined. AI helps manage these staggering numbers and bring them into controllable proportions by training complex models and deriving value from them…

4.4. Molecular design

Digitalist: The Staggering Impact Of AI In Current And Future Healthcare
(https://www.digitalistmag.com/digital-economy/2019/09/17/staggering-impact-of-ai-in-current-future-healthcare-06200631)

(Sept 19) Researching new drugs or enhancing an existing intervention is a critical, yet extremely slow and challenging, task in the medical field.

AI and machine learning (ML) enhance the study, analysis, regeneration, and representation of structural molecules and their physical and chemical properties. The traditional process of studying, analyzing, and experimenting using enormous data sets for molecular design and drug discovery involves a lot of manual effort and is error-prone, complicated, and time-consuming.

However, ML and AI can accelerate the entire process by using automation and optimization models and produce enriched and cost-effective results with minimal human errors.

4.5. Amazon is now offering virtual health care to its employees

https://www.theverge.com/2019/9/24/20882335/amazon-care-telemedicine-employees-healthcare

(Sept 19) Amazon Care offers medical care on the go.
Some Amazon employees and their families in Seattle now have access to a new app called Amazon Care, a program that provides users with access to health professionals over video chat and text. The move comes as Amazon has sought to cut internal health costs even as it's continued to muscle into the growing health care market.

4.6. Exploring the Convergence of the IoT and Patient Safety

https://readwrite.com/2019/11/08/exploring-the-convergence-of-the-iot-and-patient-safety/

(Nov 19) The growth and explosion of IoT technology has been astonishing to watch over the past few years. And while we often discuss the impact it's having in tech and consumer products niches, it's having an equally profound impact in healthcare – particularly when it comes to patient safety.

4.7. Can IoT Bridge The Gaps In Modern Mental Health Treatment?

https://readwrite.com/2019/11/06/can-iot-bridge-the-gaps-in-modern-mental-health-treatment/

(Nov 19) Mental illness doesn't discriminate. In fact, every year one-fifth of Americans experiences a clinical mental health disorder, whether or not they are diagnosed or receive treatment. That means that even if you haven't personally experienced a mental health crisis, you certainly know someone who has, even if they don't talk about it.

Unfortunately, despite the serious impact of mental illness on society – mental health disorders are, for example, a key reason for lost economic productivity – our existing mental health care system isn't equipped to support patients and their families. There aren't enough practitioners, especially outside of major cities, many don't take insurance, and waiting lists can stretch on for months for top programs. That's why a growing number of people are turning to the digital world for care, with IoT and other connected tech presented as the perfect way to bridge the care gap.

4.8. Google confirms plans for a search tool that can analyze millions of health records

https://thenextweb.com/google/2019/11/12/google-confirms-plans-for-a-search-tool-that-can-analyze-millions-of-health-records/

(nov 19) It's a known fact that Google, along with other major tech players like Amazon, Apple, and Facebook, are increasingly trying to grab a slice of the $3 trillion dollar healthcare industry. Now, the search giant is flexing its cloud muscle to team up with healthcare providers to make further inroads.

To that effect, Google has announced a partnership with Ascension, the second largest health system in the US, in a deal that gives it access to personal health datasets that can be used to develop AI-based tools for medical providers.

5. Environment

5.1. How AI could save the environment

https://www.techrepublic.com/article/how-ai-could-save-the-environment/

(Apr 19) Artificial intelligence techniques are now used to monitor endangered species, track diseases, and optimize crops. But there's much more work to be done.

Advances in artificial intelligence (AI) could be one of the solutions to solving major global environmental crises--from climate change to animal endangerment to disease containment--as projects in each of these areas are already underway.

5.2. Training AI Is Shockingly Costly to the Environment

https://interestingengineering.com/training-ai-is-shockingly-costly-to-the-environment

(Jun 19) Training AI models has a huge carbon footprint.

We have seen the result of new artificial intelligence powered algorithms that can do everything from detect cancer to help drive cars.

AI is at the driving force of so many new technologies, but at what cost?

A new report shows that a common AI training model can emit more than 626,000 pounds of carbon dioxide equivalent. That's about five times the lifetime emissions of the average American car - including the manufacture of the car itself.

5.3. Smart technology and the environment

With environmental concerns rising up the agenda of students and institutions, Paula Benoit, CEO PCCW Global Networks (UK), explains how technology infrastructure can be part of the solution.

https://universitybusiness.co.uk/Blog/smart-technology-and-the-environment/

(Jul 19) There's been a significant increase in environmentalism in the past few years as more and more people realise that human activity is damaging our planet. The student population is

particularly vocal, with many campaigning actively to help protect our planet for future generations.

This environmental awareness has shone light on where we live and work. Our homes and offices all require heating and lighting and consequently their efficiency, or lack of, has a huge effect on the environmental impact a building has. Student accommodation is no different and today more students are looking to live somewhere that is safe, secure and better for the planet.

5.4. How artificial intelligence can tackle climate change

The biggest challenge on the planet might benefit from machine learning to help with solutions. Here are a just a few.

https://www.nationalgeographic.com/environment/2019/07/artificial-intelligence-climate-change/

(Jul 19) Climate change is the biggest challenge facing the planet. It will need every solution possible, including technology like artificial intelligence (AI).

Seeing a chance to help the cause, some of the biggest names in AI and machine learning—a discipline within the field—recently published a paper called "Tackling Climate Change with Machine Learning." The paper, which was discussed at a workshop during a major AI conference in June, was a "call to arms" to bring researchers together, said David Rolnick, a University of Pennsylvania postdoctoral fellow and one of the authors.

5.5. AI can help us fight climate change. But it has an energy problem, too

https://horizon-magazine.eu/article/ai-can-help-us-fight-climate-change-it-has-energy-problem-too.html

(Sept 19) Artificial intelligence (AI) technology can help us fight climate change – but it also comes at a cost to the planet. To truly benefit from the technology's climate solutions, we also need a better understanding of AI's growing carbon footprint, say researchers.

5.6. Application of Artificial Intelligence in Environmental Science

https://medium.com/datadriveninvestor/application-of-artificial-intelligence-in-environmental-science-ec5fb317cc10

(Sept 19) With the help of Artificial intelligence Services, IBM is testing a new way to reduce Beijing's stagnant air pollution. China's capital, like many other cities in the country, is surrounded by factories, fueled by much coal, which releases harmful particles. Pollution levels may vary depending on industrial activity, traffic congestion and weather conditions.

5.7. Amazon, Google, Microsoft: Here's Who Has the Greenest Cloud

https://www.wired.com/story/amazon-google-microsoft-green-clouds-and-hyperscale-data-centers/

A WIRED report card on the top three cloud providers shows how their environmental claims stack up.

(Oct 19) "Data is the new oil" may have outlasted its usefulness as a metaphor, but one aspect still rings true: Both industries have a serious environmental footprint. According to the Department of Energy, data centers account for about 2 percent of *all* electricity use in the US.

5.8. How technology is influencing the future of food and housing - whilst respecting the environment

https://www.euronews.com/2019/10/07/how-technology-influencing-the-future-of-food-and-housing-whilst-respecting-the-environment

(Oct 19) Agriculture is facing a historical challenge. In the next 30 years, food demand will increase by 70 %**.**

Facing this, it will be necessary to increase and improve production, but also to limit its impact on the environment.

Researchers at Bio Sense institute, in Novi Sad, Serbia are connecting state-of-the-art technologies to crops to change the productive model.

Their mantra: "we cannot feed today's world with yesterday agriculture".

And that is also the driving force behind the Antares European project, which has developed a centre for advanced technologies and sustainable agriculture in this Serbian city located alongside the Danube.

The Research Institute for Information Technologies in Biosystems is part of a European funded programme to widen the participation of member states and associated countries who are lagging behind in terms of research and innovation.

5.9. Machine Learning Technology to Help Manage Energy Operations of C&I Buildings

https://www.environmentalleader.com/2019/11/machine-learning-technology-to-help-manage-energy-operations-of-ci-buildings/

(Nov 19) Verdigris Technologies, developers of Artificial Intelligence (AI) solutions, has partnered with Global Electrification company, ABB, bringing Verdigris's machine-learning applications to ABB's global line of connected low-voltage switching fabric products to predict unplanned surges in power consumption for commercial and industrial buildings. The electrical equipment, power, robotics and automation company is launching a new digital energy app-store and Verdigris's AI technology is their first app.

6. Trust, Privacy and Security

Data Privacy

6.1. Data Privacy Attitudes and Connected Cars: A Deeper Look

https://readwrite.com/2019/01/31/data-privacy-attitudes-and-connected-cars-a-deeper-look/

(jan 19) 2019 may well be a tipping point in consumer and public policymakers' attitudes about data privacy. The year 2018 started out with an explosion of revelations about consumers' data being shared with companies without their consent. With connected cars soon to become the norm for new car sales, automotive original equipment (OEMs) need to take note of consumers' attitudes about the data that their cars will be emitting.

6.2. Apple is now presenting its privacy policy as if it were another product

https://www.engadget.com/2019/11/06/apple-redesigned-privacy-policy-pages/

(Jun 19) The privacy policies themselves have not changed.
It's not uncommon for users to skip reading an app's privacy policy because it's too long and jumbled. Apparently, Apple wants to change that. Today, it released a new privacy page that makes its privacy policy easier to read and understand. The new privacy page looks more like a product page than your standard screen of black and white text.

6.3. A List of All Companies Secretly Listening In On Your Conversations

https://www.technowize.com/a-list-of-all-companies-secretly-listening-in-on-your-conversations/

(Aug 19) Facebook is back in the news facing fresh scrutiny over its handling of user data.

6.4. Security and protection of critical patient data

Digitalist: The Staggering Impact Of AI In Current And Future Healthcare (https://www.digitalistmag.com/digital-economy/2019/09/17/staggering-impact-of-ai-in-current-future-healthcare-06200631)

(Sept 19 Apart from the strands of science and technology where AI has already proven to be a key stimulus, there are scores of other areas – like connected devices, advanced diagnostics, robot-assisted surgeries, drug discovery, pain handling, virtual nurses, disease detection, etc., – where it can be of greater use.

However, along with its great promise come a few hurdles. Will AI be able to safeguard the security and privacy of critical patient and other consumer data? How willing and keen are the participants, investors, and contributors to accept the risks and continue forward? How cost-effective, scalable, and profitable will these solutions be? These are some of the looming questions that need to be addressed to ensure that the path of AI in healthcare is smooth and propitious.

6.5. New AI Face Anonymization Model Protects Privacy

Digitalist: The Staggering Impact Of AI In Current And Future Healthcare (https://www.digitalistmag.com/digital-economy/2019/09/17/staggering-impact-of-ai-in-current-future-healthcare-06200631)

(Sept 19) A team of researchers from the Norwegian University of Science and Technology recently proposed a new architecture that can anonymize faces in images automatically while the original data distribution remains uninterrupted.

(read also: ***DeepPrivacy: A Generative Adversarial Network for Face Anonymization*** https://arxiv.org/abs/1909.04538)

6.6. Chrome rolls out new protections preventing password and data theft

https://arstechnica.com/information-technology/2019/10/chrome-rolls-out-new-protections-preventing-password-and-data-theft/

(oct 19) *Site isolation debuts in Android Chrome while desktop versions extend it to new fronts.*

Google is temporarily increasing the rewards it pays for hacks that exploit holes in a beefed-up security protection that debuted in desktop versions of Chrome last month. Chrome for Android, meanwhile, is receiving a slimmed-down version of the same protection.

6.7. Internet of Things Makes it Easier to Steal Your Data

https://readwrite.com/2019/12/09/internet-of-things-makes-it-easier-to-steal-your-data/

(Dec 19) With IoT technology expanding its presence in our lives, we are putting them to a new danger. Internet of things brings to our house devices packed with various sensors, cameras, microphones, and capability to transfer data over the Internet. How do we know that those devices are not sending the data where they shouldn't?

Trust:

6.8. Adobe, Twitter and the New York Times team up to fight digital fakes

https://www.engadget.com/2019/11/04/adobe-twitter-nyt-digital-content-attribution/

(Apr 19) They're working on a standard that gives credit to the original creators.
Adobe, Twitter and the *New York Times* are tired of seeing fake media propagate, and they're teaming up to do something about it. The trio has launched a Content Authenticity Initiative that aims to create a standard for digital media attribution. Ideally, you'd know whether or not a picture or video is legitimate simply by examining the file -- you'd know if it had been manipulated.

6.9. Facebook Introduces Dataset & Challenge to Counter DeepFakes

https://syncedreview.com/2019/09/06/facebook-introduces-dataset-challenge-to-counter-deepfakes/

(Sept 19 In collaboration with Partnership on AI, Microsoft, and academics from top universities, Facebook today announced the Deepfake Detection Challenge (DFDC) with the aim of finding innovative deepfake detection solutions to help the media industry spot videos that have been morphed by AI models.

6.10. Three threats posed by deepfakes that technology won't solve

https://www.technologyreview.com/s/614446/deepfake-technology-detection-disinformation-harassment-revenge-porn-law/

(Oct- 19) As deepfakes get better, companies are rushing to develop technology to detect them. But little of their potential harm will be fixed without social and legal solutions.

6.11. OpenAI published the tool that writes disturbingly believable fake news

https://www.engadget.com/2019/11/07/openai-published-ai-gpt-fake-news/

(Nov 1) It originally said the AI was too dangerous to release in full.
In February, OpenAI announced that it had developed an algorithm that could write believable fake news and spam. Deciding that power was too dangerous to unleash, OpenAI planned a staged release so that it could offer pieces of the tech and analyze how it was used. Now, OpenAI says it has seen "no strong evidence of misuse," and this week, it published the full AI.

6.12. Is Artificial Intelligence Racial Bias Being Suppressed?

https://readwrite.com/2019/11/25/is-artificial-intelligence-racial-bias-being-suppressed/

(Nov 19) Artificial Intelligence (AI) and Machine Learning are used to power a variety of important modern software technologies. For instance, AI powers analytics software, Google's bugspot tool, and code compilers for programmers. AI also powers the facial recognition software commonly used by law enforcement, landlords, and private citizens.

Security:

6.13. How IoT Monitoring Is Going to Change How We Think About Privacy and Security

https://readwrite.com/2019/09/06/how-iot-monitoring-is-going-to-change-how-we-think-about-privacy-and-security/

(Sept 19) Most industries are already making use of IoT monitoring devices, designed to provide better security, better safety, or more data to the companies creating them—or some combination of the three. The emergence of devices like these has been an impressive boon both to tech companies and companies of various industries making use of them. Tech companies get a blue ocean of new opportunities for innovation, and companies of other industries have new ways to collect data or improve their businesses.

6.14. Data Security in a Connected Car World

https://readwrite.com/2019/10/17/data-security-in-a-connected-car-world/

(Oct 19) A recent survey from auto shopping and research site CarGurus.com asked consumers questions about their knowledge of connected car security. The results were startling: consumers scored an average grade of a failing 49%.

When this is paired with Upstream's data showing that connected-car attacks have increased six-fold from 2014-2018. It suggests that consumers haven't been able to keep up with connected car technology, despite their increasing adoption rates.

7. Business and Economy

7.1. The new data-driven economy

Digitalist: Trends based on the Digitalization of Society
(https://www.digitalistmag.com/cio-knowledge/2019/09/17/trends-based-on-digitalization-of-society-06200592)

(Sept-19) Next on NTT Data's list of trends based on the digitalization of society is the role of data in our economy. The key is, however, to convert this data into a useful format. Real-time and predictive data have already enhanced analytics capabilities and enabled new business models. This is just the start, though. We are yet to truly unlock the potential of data, but huge leaps have been taken toward a data-driven economy. Examples of this include predicting trends in the stock market, election results, and even how fashion will change.

Gathered information is also changing transportation. Even a couple of decades ago, the idea of autonomous vehicles seemed like a distant and possibly unrealistic concept. Data is now making this a reality. Analysis of real-time location and traffic data has led to the introduction of autonomous cars on our roads. How long until these become the standard? Simply put, data is the most important resource of our time and is going to be the catalyst for revolutionizing nearly every aspect of our society.

7.2. Physical digital convergence

Digitalist: Trends based on the Digitalization of Society
(https://www.digitalistmag.com/cio-knowledge/2019/09/17/trends-based-on-digitalization-of-society-06200592)

(Sept 19) The last trend is physical digital convergence. This is the fusion of the digital and physical world – a vital step for the digitalization of society. But what does this entail? Coexisting with artificial intelligence (AI) is key to achieving this step, and it has already begun. AI-enabled devices are already in millions of homes around the world. Examples include virtual assistants on smartphones and smart speaker interfaces. The quality of AI will only improve, though, meaning we could even automate all shopping orders with a digital assistant in the future, thus simplifying aspects of everyday life.

Our interaction with other people may also change. Once AI becomes more advanced, it is likely that customer service centers will be automated. We will also probably see a change to typical user interfaces. Will the conventional computer be replaced with more efficient tools and interfaces that only require voice commands? It's completely possible. The convergence of the physical and digital world is likely to accelerate many features of human activity.

7.3. Is Amazon Bank the Future of Banking?

https://readwrite.com/2019/09/23/is-amazon-bank-the-future-of-banking/

(Sep 19) Business owners and consumers may want to brace themselves for the next massive Amazon shakeup. Financial analysts forecast that Amazon could one day become a formidable leader in the finance industry. In a short five year period, experts forecast that up to 70 million consumers may turn to the retail giant for banking services. If the experts are right, Amazon will have more banking customers than the United Kingdom has citizens. Is Amazon Bank the future of banking?

7.4. Industries Destined for Technological Disruption

https://readwrite.com/2019/09/05/5-industries-destined-for-technological-disruption

(Sep 19) We've heard tales of technological transformation for a while, and those stories are (finally) moving into their next chapters. The International Data Corporation suggests that 60% of global GDP will come from digital organizations by 2022. These players are taking advantage of big data, powerful analytics, artificial intelligence, and other key innovations to drive growth. Check out the industries that are destined for technological

7.5. IoT in eCommerce: Technologies Change the Industry

https://readwrite.com/2019/10/31/iot-in-e-commerce-technologies-change-the-industry/

(Oct 19) Imagine you have to buy new headphones, what will you do: go to the nearest store or open a browser or jump on your mobile app? More and more people today tend to choose the second variant since it takes less time and effort. The number of online-shoppers will keep growing, as e-commerce — online commercial transactions — becomes more comfortable by introducing high-tech solutions, for example, IoT-based.

IoT (Internet of Things) is an ecosystem of smart devices that have access to the internet and can communicate with each other. IoT changes the eCommerce industry not only from the consumers' side but also from the inner one. (e.g., processes like inventory management, logistics.) The changes IoT brings to the e-commerce industry are both positive and negative.

7.6. How are the Top MNCs Using Big Data Analytics to their Advantage?

https://readwrite.com/2019/10/31/how-are-the-top-mncs-using-big-data-analytics-to-their-advantage/

(Oct 19) Big Data analytics have helped the organization to double its revenue in no time. An intelligent analysis of data is what you need if you wish to succeed in the coming years. Success is why almost all the top MNCs have adopted and started implementing big data practices for their databases.

Today we will see as to how these MNCs are using big data to their advantage.

7.7. How will 5G changes our lives?

https://readwrite.com/2019/10/02/how-will-5g-changes-our-lives/

(Oct 19) Having been in development for the best part of 10 years, 5G is now starting to infiltrate the mainstream. The next-generation mobile broadband tech could potentially alter our lives in many ways over the next few years. Changes will be in the way we do business to surgical operations could be influenced by this exciting technology. Will 5G change our lives?

7.8. Open Applications and Solving the Future of Platform Economics

https://readwrite.com/2019/11/05/open-applications-and-solving-the-future-of-platform-economics/

(Nov 19) Throughout 2019 we've witnessed the blockchain landscape shifting from a strong focus on enterprise use cases to the introduction of new technical layers within the ever-evolving "stack" to now the rise of decentralized applications (dApps). As this part of landscape expansion, further focus comes around the challenges of data, privacy, and the future economics models that will power the applications of tomorrow.

7.9. Why Multicultural Marketing Needs Machine Learning and Facial Tracking

https://readwrite.com/2019/11/10/why-multicultural-marketing-needs-machine-learning-and-facial-tracking/

(Nov 19) Marketers in 2019 will find it hard to be successful without understanding the cultural transformation that's happening in this country. Between 2012 and 2017, the US multicultural population – Hispanics, African Americans, and Asian Americans – grew to 11.7 million people. Notably, these groups are younger and growing at a faster rate than their White counterparts. This makes multicultural marketing an essential component of all advertising campaigns.

7.10. A Megatrend Set to Disrupt the Business World

https://readwrite.com/2019/11/04/a-megatrend-set-to-disrupt-the-business-world/

(Nov 19) Today we navigate our way across cities, pull up electronic tickets, purchase items, monitor our health, and, of course, stay connected with friends and family on our smartphones. The smartphone is one of those innovations that make us think, "how did I ever function without it?" Smartphones revolutionized our personal lives, but there's a megatrend set to disrupt the business world; it's called augmented analytics.

Augmented analytics is on the cusp of becoming the business world's next significant evolution.

Gartner identified augmented analytics as to the number 1 top trend for data and analytics technology in 2019, and market leaders are already starting to invest in this burgeoning industry.

7.11. Huawei lanza gafas inteligentes que permiten contestar llamadas y escuchar música

https://es.digitaltrends.com/vestibles/huawei-gafas-inteligentes/

(Nov 19) Creadas en conjunto con Gentle Monster, Huawei presentó sus ligeras gafas X Gentle Monster Eyewear, que no solo protegen contra los rayos del sol, también cuentan con funciones de audio, en el marco de la convención Madrid Craft Week que se celebra del 11 al 17 de noviembre en la capital española.

Además de ser un artículo de moda, los lentes del fabricante chino cuentan con características de audio inteligente, las cuales permiten a los usuarios tener una comunicación intuitiva y realizar o recibir llamadas, escuchar música y programar alarmas, entre otras acciones. Las gafas integran un doble altavoz y tecnologías de reducción de ruido por medio de un micrófono dual de una sola cara.

7.12. ¿Qué hay tras el éxito de TikTok, uno de los fenómenos de redes sociales?

https://es.digitaltrends.com/sociales/exito-tik-tok/

(Nov 19) Las claves que llevaron a Tiktok a ser una de las apps más descargadas
Es un verdadero fenómeno en redes sociales, especialmente entre jóvenes y adolescentes. Con más de 500 millones de usuarios activos a nivel global, TikTok se transformó en octubre de 2019 en la aplicación más descargada del mundo, desplazando a Whatsapp, la poderosa app de mensajería instantánea.

TikTok es un software que permite crear y compartir de videos cortos. Creada en 2018 por la compañía china ByteDance, surgió como fruto de la fusión de las aplicaciones Douyin —nombre con el cual TikTok opera en China— y de la desaparecida Musical.ly, una red social que fue popular para realizar doblajes de canciones.

7.13. Eigen nabs $37M to help banks and others parse huge documents using natural language and ‘small data’

http://techcrunch.com/2019/11/14/eigen-nabs-37m-to-help-banks-and-others-parse-huge-documents-using-natural-language-and-small-data/

(Nov 19) One of the bigger trends in enterprise software has been the emergence of startups building tools to make the benefits of artificial intelligence technology more accessible to non-tech companies. Today, one that has built a platform to apply power of machine learning and natural language processing to massive documents of unstructured data has closed a round of funding as it finds strong demand for its approach.

7.14. Twitter will fund development of an open social media standard

https://www.engadget.com/2019/12/11/twitter-open-social-media-standard/?utm_campaign=homepage&utm_medium=internal&utm_source=dl

(Dec 19) Twitter is funding a team to develop an open and decentralized standard for social media. CEO Jack Dorsey announced the effort, called Bluesky, today. In a series of tweets, Dorsey said Twitter will fund a "small independent team" of up to five open source architects, engineers and designers, and that the platform will provide just one direction: find an existing decentralized standard to advance or create one from scratch.

7.15. Big Tech Faces Data Collection Scrutiny, but Big Insurance Might be Next

https://readwrite.com/2019/12/05/big-tech-faces-data-collection-scrutiny-but-big-insurance-might-be-next/

(Dec 19) For most of the past decade, people all around the world sat and watched as significant tech companies started to expand their reach into every part of our daily lives. In many cases, the results were positive, like bringing our favorite entertainment to every device we own. We loved being able to order food and consumer goods with unparalleled ease. Here's how big tech faces data collection scrutiny — but big insurance might be next (we hope).

7.16. Leveraging Big Data that Data Websites Should Track

https://readwrite.com/2019/12/10/leveraging-big-data-that-data-every-website-should-track/

(Dec 19) Creating a product that solves customers' problems is not just a matter of intuition, expertise, or brainstorming. Often, marketers get so overly confident in their knowledge of the market. A marketer may believe that there's always the option to look at the state of things. Instead of imagining what the options might be, sales and marketing need to be analyzing and leveraging the data. Here is leveraging big data that data websites should track.

8. Automation

8.1. Automation, AI and Analytics: Big Data Gets Bigger

https://www.contactcenterpipeline.com/Article/automation-ai-and-analytics-big-data-gets-bigger

(Mar 19) Although the term “Big Data” has actually been around since the 1990s, it was only in the last decade or so that it became common terminology in the contact center industry. Big Data originally referred to data sets that were too large or complex for traditional data processing applications software to deal with, like recorded conversations between a contact center agent and a calling customer. While unstructured data such as these recorded conversations held a wealth of customer data and business intelligence, the quantities of data were more than modern technology at the time could process into usable information.

8.2. MIT and Ford help delivery robots navigate to your doorstep

https://www.engadget.com/2019/11/04/mit-ford-robots-mapping-last-mile-deliveries/

(Apr 19) Their technique doesn't require mapping areas in advance.
In order for delivery robots to drop your takeout, package or meal-kit at the door, they'll need to be able to find the door. In most cases, that requires mapping a location in advance so that the robot knows where to go. But to do that on a large scale is challenging and raises security and privacy concerns. Now, a team of engineers from MIT and Ford Motor Company think they might have an answer. They've created a technique that allows robots to navigate via clues, rather than maps.

8.3. AI & Automation: An Overview

https://www.gsma.com/futurenetworks/wiki/ai-automation-an-overview/

(Jun 19) This paper seeks to introduce how AI technologies will empower intelligent networks, which are increasingly becoming integral to simplified 5G networks and services. Its scope extends to four key areas; firstly a baseline understanding on the intelligent network concept, followed by architecture framework, thirdly, the level classification of AI in Network for realising

the intelligent network step by step and lastly a call for the contribution of case studies of AI in Network in the industry.

8.4. How Much of Your Home Life Will Be Automated in 2030?

https://readwrite.com/2019/09/04/how-much-of-your-home-life-will-be-automated-in-2030/

(Sep 19) Automation is already taking over your home and your workplace. We're using complex algorithms to handle back-end processes, and we have in the tech industry for many years, but now users are starting to create their own mini algorithms. For example, if you have a smart home device like a smart thermostat, you may have it set to raise the temperature around 5 pm, in anticipation of you getting home from work, but lower the temperature around 8 am, when you leave for work.

This is automation—taking care of the tasks you'd do otherwise, without your manual input. And as you might suspect, a greater portion of your life is going to be automated in the future as new apps, new devices, and other kinds of new technology emerge.
But exactly how much of your home life will be automated by 2030? And is that level of automation a good thing?

8.5. Intelligent Automation: A Step Ahead of AI

https://www.informationweek.com/big-data/ai-machine-learning/intelligent-automation-a-step-ahead-of-ai/a/d-id/1335914

(Oct 19) Organizations that use intelligent automation to amplify human potential will stay ahead in the game, while those that don't will lag.

8.6. Unlocking the full power of automation in industrials

https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/unlocking-the-full-power-of-automation-in-industrials?cid=other-eml-alt-mip-mck&hlkid=726cec37a9a141c984aad6e30673c8a4&hctky=1712013&hdpid=d2fb78e1-4691-48fa-a24d-7b6a852b30f1

(Oct 19) The automation of nonphysical core processes is an often-overlooked source of value in industrials.

Automation will drastically alter the way companies work, and this potential makes it a top priority for many business leaders. Indeed, McKinsey research shows that up to 50 percent of work performed today can already be automated with currently available technology. However, companies in the heavy industry sector (such as in energy, mining, utilities, and manufacturing) tend to struggle to set bold aspirations, develop robust business cases, and devise effective deployment approaches to take advantage of automation. Building these capabilities could help these companies capture benefits at scale, improve customer and employee experience, and build a long-term competitive advantage. Article (PDF-778KB)

8.7. Cognitive Automation is the Immediate Future of Team Management

https://readwrite.com/2019/11/04/cognitive-automation-is-the-immediate-future-of-team-management/

(Nov 19) For all the anticipation of increased automation at work, commentators have spent a lot of energy trying to convince people it can only handle easy, repetitive processes. It's time to finally confront the truth: Per the McKinsey Global Institute, today's robots can handle up to a quarter of the average CEO's job and 35% of management tasks.

While robotic process automation refers to using robots to speed up concrete processes, cognitive automation takes a more advanced version of the same underlying tool set and applies it to more conceptual, judgment-based tasks — what we now call "knowledge work."

8.8. Walmart will test driverless grocery deliveries in Houston

https://www.engadget.com/2019/12/10/walmart-driverless-grocery-deliveries-houston/

Nuro's self-driving courier cars will save you a trip to the store.

(Dec 19) Walmart is about to experiment with autonomous grocery delivery in a big way. The big-box retailer is launching a pilot program in Houston that will use Nuro's self-driving R1 vehicle to shuttle food from "select" stores to customers who've opted into the program. The companies didn't outline how customers would enroll, but Houstonians can expect service to start in the "coming weeks."

9. Quantum Computing

9.1. Dutch researchers are developing quantum technology to secure your bank account

https://thenextweb.com/future-of-finance/2019/07/15/quantum-key-distribution-to-secure-bank-account/

(Jul 19) Quantum computers are expected to exceed the capabilities of classical computers in the next five to 10 years and promise vast increases in processing power over silicon chips. It could mean great things for answering some of the world's toughest scientific questions, but it's also a cause for concern.

9.2. Quantum Information and AI. Exploring the term and history in the context of new developments in artificial intelligence

https://towardsdatascience.com/quantum-computing-and-ai-789fc9c28c5b

(Oct 19) Since there is so much talk of quantum computing I thought it would be appropriate to explore a term I came across, namely quantum neural networks. However to do this I must contend with the term *'quantum information'*. As I am proficient in neither you must see this article as a struggle to understand rather than any final answer. You can see the first segment as a summary of articles on the history of quantum computing from NIST.

9.3. Google's Sycamore sparks Quantum Supremacy rivalry

https://www.technowize.com/googles-sycamore-sparks-quantum-supremacy-rivalry/

(Oct-19) On October 23, 2019, Google made a huge revelation – its quantum computer 'Sycamore' had reached **Quantum Supremacy.** Meaning, it can perform a calculation way faster than a regular binary computer.

9.4. Quantum computing's potential is still far off, but quantum supremacy shows we're on the right track

https://www.oreilly.com/radar/quantum-computings-potential-is-still-far-off-but-quantum-supremacy-shows-were-on-the-right-track/

(Nov-19) In this edition of the Radar column, we explore Google's quantum supremacy milestone.

Like the horizon, or maybe nuclear fusion, the tantalizing promise of quantum computing, with its punctuated progress, always seems the same distance away. Until now. In this month's Radar column, Mike Loukides provides nuanced context to the announcement of Google's breakthrough in quantum computing—the first example of quantum supremacy. Mike notes that while the trivial computation is just a first step in what he expects to be a long process, for the future of quantum computing, this is "very big news."

9.5. Ford quantum computing experiment cuts traffic, commute times

It's a joint research project with Microsoft.

https://www.cnet.com/roadshow/news/ford-quantum-computing-experiment-cuts-traffic-commute-times/

(Dec 19) Quantum computers are highly experimental today, but Ford says it's got evidence the radical new technology already shows promise for improving transportation. Through a partnership with Microsoft, it used "quantum-inspired" technology -- though not an actual quantum computer -- to test a traffic-routing algorithm that cut Seattle traffic by 73% and shortened commuting times by 8% in a simulation of 5,000 cars.

10. Interfaces

10.1. Amazon preparing a wearable that ‘reads human emotions,’ says report

https://www.theverge.com/circuitbreaker/2019/5/23/18636839/amazon-wearable-emotions-report

(May 19) Time to strap Alexa to your wrist and let it know how you really feel.
In a week of eyebrow-raising headlines surrounding the US-China trade spat, this latest report from *Bloomberg* still manages to stand out: Amazon is said to be working on a wrist-worn, voice-activated device that’s supposed to be able to read human emotions. This would be a rather novel health gadget, of the sort we’re more used to seeing in tenuous crowdfunding campaigns instead of from one of the world’s biggest tech companies.

10.2. Facebook wants to replace your smartphone with Orion AR Glasses

https://www.technowize.com/facebook-wants-to-replace-your-smartphone-with-orion-ar-glasses/

(Sep 19) Facebook is partnering with Luxottica (owner of Ray-Ban, Chanel, Oakley and other brands) on AR glasses nicknamed **Orion**. According to tipsters, the eyewear would be a promising phone replacement. Orion AR Glasses users will be able to take calls, Livestream to social media followers, and much more. The device will bear functional similarities to Google Glass.

10.3. ¡Cuidado, Siri! Teléfonos Huawei estrenan asistente inteligente propio

https://es.digitaltrends.com/celular/asistente-inteligente-huawei/

(Sept 19) El fabricante Huawei sigue apostando por la vía de la innovación y de dotar de más recursos a los usuarios sus teléfonos. En ese sentido, lo último que acaba de anunciar la firma es Huawei Assistant, un asistente que facilitará la relación entre el usuario y su dispositivo. Este sistema es movido por la plataforma Huawei Ability Gallery basada en inteligencia

artificial (IA), que permitirá a las personas ahorrar tiempo al aprovechar las funciones o realizar actividades con sus dispositivos.

10.4. People Power Company. Humanizing the Internet of Things.

https://readwrite.com/2019/11/05/people-power-company-humanizing-the-internet-of-things/

(Nov 19) Gene met David while working at a telecommunications company – BitFone. Gene served as CEO and David as a lead engineer. BitFone's software was used in more than 300 million phones, and was adopted by 3 of the top 5 mobile operators and all of the top 6 handset manufacturers. BitFone was acquired by HP for $160 million in 2007.

In 2009, Gene had his "aha" moment when he connected the dots on the potential of the connected world. Gene realized that every light, door, car, switch, meter, home, building, and more should be connected. It was obvious to him that IoT would be 10- to 100-times the market size of mobility. In 2009, Gene and David founded People Power Company and started recruiting stars from the Bitfone team.

10.5. Google Assistant's interpreter mode is coming to phones today

"Hey Google, help me speak Thai"
https://www.theverge.com/2019/12/12/21010451/google-assistant-interpreter-mode-android-ios-apps

(Dec 19) Interpreter mode, the feature that allows Google Assistant to translate your conversations in real time, is coming to phones. Google says it will work with 44 languages and can be invoked by saying commands like "Hey Google, help me speak Thai" or "Hey Google, be my German translator."

Once you're in interpreter mode, the Assistant will translate your speech and read it out loud. On phone screens, the Assistant is able to offer up Smart Replies that can speed up the conversation by letting you respond without having to speak.

11. AI (general)

11.1. DeepLearning

https://syncedreview.com/2019/02/15/ai-hasnt-found-its-isaac-newton-gary-marcus-on-deep-learning-defects-frenemy-yann-lecun/

(Feb-19) Although deep learning has historical roots going back decades, neither the term "deep learning" nor the approach was popular just over five years ago, when the field was reignited by papers such as Krizhevsky, Sutskever and Hinton's now classic 2012 (Krizhevsky, Sutskever, & Hinton, 2012)deep net model of Imagenet. What has the field discovered in the five subsequent years? Against a background of considerable progress in areas such as speech recognition, image recognition, and game playing, and considerable enthusiasm in the popular press, I present ten concerns for deep learning, and suggest that deep learning must be supplemented by other techniques if we are to reach artificial general intelligence. (Read also: https://arxiv.org/ftp/arxiv/papers/1801/1801.00631.pdf)

11.2. How AI is Learning to Play with Words

https://readwrite.com/2019/09/14/how-ai-is-learning-to-play-with-words/

(Sep 19) Imagine you go to a bookstore, and you notice and exciting cover. You pick the book, read the summary at the back, and the rave reviews. The plot seems intriguing enough, but when you check for the writer, it says " by AI-something." Would you buy the book, or would you think that was a waste of money? We will have those decisions moving into the future, and who will be responsible for such writings? But, that shows how AI is learning to play with words.

11.3. DARPA is betting on AI to bring the next generation of wireless devices online

https://www.technologyreview.com/s/614627/5g-ai-darpa-next-generation-of-wireless-devices/

(Oct 19) In the agency's latest grand challenge, teams competed for $2 million and a chance to shape the future of communication technology by finding a better way to carve up the radio spectrum.

In the agency's latest grand challenge, teams competed for $2 million and a chance to shape the future of communication technology by finding a better way to carve up the radio spectrum.

11.4. Google researchers taught an AI to recognize smells

https://www.engadget.com/2019/10/24/google-researchers-train-ai-smells/?guccounter=1&guce_referrer=aHR0cHM6Ly9uZXdzZGF0YWRhaWx5LmNvbS8&guce_referrer_sig=AQAAAMmtT61FPaULd7Y5QivNVa4StTrpZYuh78O8JfeKYpgR7teXRwdn4-ucppjbXrDOricm3WaGVKsiJX7-npbxwmQRLZwIxVJ1co-4PVszFxg68kuPY0yjc3s61X_tDF3F3wxQyTkNBtw2iCvkoGXmpjOdL7fKXDsQ6q_w8OZu9ICS

(oct 19) Their algorithms can identify odors based on their molecular structures.

For decades, perfumers and scientists have struggled to predict the relationship between a molecule's structure and its scent. While scientists can look at a wavelength of light and identify what color it is, when it comes to scents, scientists can't simply look at a molecule and identify its odor. Researchers from the Google Brain Team are hoping AI might change that. In a paper published on Arxiv, they explain how they're training AI to recognize smells.

The researchers created a data set of nearly 5,000 molecules identified by perfumers, who labeled the molecules with descriptions ranging from "buttery" to "tropical" and "weedy." The team used about two-thirds of the data set to train its AI (a graph neural network or GNN) to associate molecules with the descriptors they often receive. The researchers then used the remaining scents to test the AI -- and it passed. The algorithms were able to predict molecules' smells based on their structures.

11.5. Intelligence May Not Be Computable

https://www.americanscientist.org/article/intelligence-may-not-be-computable
By Peter J. Denning***,*** Ted G. Lewis

(oct 19) A hierarchy of artificial intelligence machines ranked by their learning power shows their abilities—and their limits.

The ultimate goal of the field of artificial intelligence (AI) is to construct machines that are at least as smart as humans at specific tasks. AI has been successful in developing machines that can learn how to recognize speech, find new classes of stars in sky surveys, win grandmaster chess matches, recognize faces, label images, diagnose diseases, hail taxis, drive cars, navigate around obstacles, and much more. Yet none of these machines is the slightest bit intelligent. How can they do intelligent things without being intelligent? Can these machines be trusted when presented with new data they have never seen before? Businesses

and governments are using AI in an exploding number of sensitive and critical applications without having a good grasp on when those programs can be trusted.

11.6. Mozilla launched #YouTubeHorrorStories about YouTube's recommendation algorithm

https://www.technowize.com/mozilla-launched-youtubehorrorstories-about-youtubes-recommendation-algorithm/

(Oct 19) The Mozilla Foundation, the maker of Mozilla Firefox or simply Firefox, just launched a site featuring 28 user-submitted stories, detailing incidents where YouTube's recommendation algorithm that sometimes leads people towards disturbing videos.

11.7. Machine Learning: A Formal Learning Model

https://readwrite.com/2019/10/14/machine-learning-a-formal-learning-model/

(Oct 19) In day to day life, individuals are effectively confronting a few choices to make. For a machine to settle on these sorts of decisions, the automatic route is to show the issues faced in a numerical articulation. The mathematical articulation could legitimately be structured from the issue foundation. Machine learning is a formal learning model.

11.8. 5 Reasons Why Artificial Intelligence is Important to You

https://readwrite.com/2019/10/09/5-reasons-why-artificial-intelligence-is-important-to-you/

(Oct 19) You have probably heard that artificial intelligence could be used to do lots of impressive tasks and jobs. AI can help designers and artists make quick tweaks to visuals. AI can also help researchers identify "fake" images or connect touch and sense. AI is being used to program websites and apps by combining symbolic reasoning and deep learning. Basically, artificial intelligence goes beyond deep learning. Here are five reasons why AI is important to you.

11.9. Mozilla and Element AI want to build 'data trusts' in the artificial intelligence age

https://thenextweb.com/artificial-intelligence/2019/10/29/mozilla-and-element-ai-want-to-build-data-trusts-in-the-artificial-intelligence-age/

(Oct 19) Mozilla, the nonprofit behind the free and open-source Firefox web browser, is partnering with Montreal-based artificial intelligence startup Element AI to push for ethical use of AI.

To that effect, the two companies are exploring the idea of data trusts, a proposed data collection approach that aims to provide individuals with greater control over their personal information.

11.10. How an AI trained to read scientific papers could predict future discoveries

https://thenextweb.com/syndication/2019/10/02/how-an-ai-trained-to-read-scientific-papers-could-predict-future-discoveries/

(Oct 19) "Can machines think?", asked the famous mathematician, code breaker and computer scientist Alan Turing almost 70 years ago. Today, some experts have no doubt that Artificial Intelligence (AI) will soon be able to develop the kind of general intelligence that humans have. But others argue that machines will never measure up. Although AI can already outperform humans on certain tasks – just like calculators – they can't be taught human creativity.

After all, our ingenuity, which is sometimes driven by passion and intuition rather than logic and evidence, has enabled us to make spectacular discoveries – ranging from vaccines to fundamental particles. Surely an AI won't ever be able to compete? Well, it turns out they might. A paper recently published in Nature reports that an AI has now managed to predict future scientific discoveries by simply extracting meaningful data from research publications.

11.11. Google updates Teachable Machine so you can train an AI without code

https://thenextweb.com/artificial-intelligence/2019/11/07/google-updates-teachable-machine-so-you-can-train-an-ai-without-code/

(Nov 19) Machine learning and artificial intelligence are complex subjects and while you might see them being mentioned every day, you might not necessarily understand how they work. Two years ago, Google launched a site called Teachable Machine, which let you train a simple model using their camera without any code. Now, it's launching an updated version so you can train more advanced models.

11.12. Machine learning algorithms and the art of hyperparameter selection

https://thenextweb.com/podium/2019/11/10/weve-got-to-regulate-the-application-of-ai-not-the-tech-itself/

A review of four optimization strategies

(Nov 19) Machine learning algorithms are used everywhere from a smartphone to a spacecraft. They tell you the weather forecast for tomorrow, translate from one language into another, and suggest what TV series you might like next on Netflix.

These algorithms automatically adjust (learn) their internal parameters based on data. However, there is a subset of parameters that is not learned and that have to be configured by an expert. Such parameters are often referred to as "hyperparameters" — and they have a big impact on our lives as the use of AI increases.

11.13. Demystifying AI: What's Fiction, and What's Worth Fanfare?

https://readwrite.com/2019/11/27/demystifying-ai-whats-fiction-and-whats-worth-fanfare/

(Nov 19) As artificial intelligence drives a fourth industrial revolution, fears and doubts about AI are pervasive. In the first industrial revolution, machines began replacing manual labor, and there were human concerns over the change. Here is demystifying AI. What's fiction and what's worth the fanfare?

11.14. China and America want the AI Prize Title: Who will Throw the Knockout Punch?

https://readwrite.com/2019/12/09/china-and-america-want-the-ai-prize-title-who-will-throw-the-knockout-punch/

(Dec 19) Between the United States and China, who's more successful in the creation of life-changing artificial intelligence? This question can't be answered in a single sentence and tied up with a bow because, truthfully, both sides have their own unique advantages and challenges. But that hasn't stopped each side from publicizing its plans for world domination.

11.15. A Web Developer's New Best Friend is the AI Waiting to be Utilized

https://readwrite.com/2019/12/09/a-web-developers-new-best-friend-is-the-ai-waiting-to-be-utilized/

(Dec 19) With the emergence of disruptive technologies like AI, machine learning, virtual reality, things seem to have gone beyond a developer discussion. Jump to the mainstream where you and I hear them — they can make us numb. Here is a web developer's new best friend is the AI waiting to be utilized.

11.16. The mind-bending confusion of 'hammer on a bed' shows computer vision is far from solved

These images are designed to fool AI
https://www.theverge.com/2019/12/12/21012410/machine-vision-ai-adversarial-images-dataset-objectnet-mit-algorithms

(Dec 19) Machine vision has been one of the biggest success stories of the AI boom, enabling everything from automated medical scans to self-driving cars. But while the accuracy of all-seeing algorithms has improved massively, these systems can still be confused by images that humans have no problem deciphering.

11.17. AI R&D is booming, but general intelligence is still out of reach

The 2019 AI Index report gives us a glimpse into AI progress.
https://www.theverge.com/2019/12/12/21010671/ai-index-report-2019-machine-learning-artificial-intelligence-data-progress

(Dec 19) Trying to get a handle on the progress of artificial intelligence is a daunting task, even for those enmeshed in the AI community. But the latest edition of the AI Index report — an

annual rundown of machine learning data points now in its third year — does a good job confirming what you probably already suspected: the AI world is booming in a range of metrics covering research, education, and technical achievements.

12. Big Data Management (general)

12.1. Microsoft's Project Silica offers robust thousand-year storage

https://arstechnica.com/gadgets/2019/11/microsofts-project-silica-offers-robust-thousand-year-storage/

(Jul 19) Ars spoke Tuesday with Dr. Ant Rowstron, a principal researcher at Microsoft Research in Cambridge, UK, about an innovative cold storage project called Silica. Silica aims to replace both tape and optical archival discs as the media of choice for large-scale, (very) long duration cold storage. Microsoft Research is partnering with film giant Warner Bros., which is directly interested in reducing costs and increasing reliability in its own cold storage programs.

12.2. DataOps and the future of data management

https://www.technologyreview.com/s/614415/dataops-and-the-future-of-data-management/

(Sept- 19) The practice focuses on collaboration and automation to speed delivery of analytics—and accelerate innovation.

12.3. Big Data Management Solving Pinpoint Problems

https://readwrite.com/2019/10/06/big-data-management-solving-pinpoint-problems/

(Oct 19) Big Data Management can light up patterns and examples that would have generally been undetectable, which at that point makes questions and investigation into how the business functions. At last, the result of such examples, the recognizable proof is frequently the capacity to anticipate when a specific business-relevant occasion is going to occur, and after that to modify as needs be in a robotized design. Big data management is solving pinpoint problems.

12.4. Data Center ARM-ification is Around the Corner

But Unfortunately Not In Your Data Center

https://gigaom.com/2019/12/06/data-center-arm-ification-is-around-the-corner/

(Dec 19) Nowadays, ARM CPUs are the predominant choice for everything outside the data center. Even some PCs are now based on this type of CPU. Several reasons for this exist, low power consumption, good-enough computing power, System-on-Chip (SoC) designs, ecosystem, ARM licensing model, and more. On the other hand, Intel lost this battle a long time ago, but X86 CPUs won hands down in the data center. Things are changing though, and ARM is becoming more attractive for data center workloads as well.

12.5. Why Volcanologists Didn't Predict New Zealand's Deadly Eruption

https://www.wired.com/story/why-volcanologists-didnt-predict-new-zealands-deadly-eruption/

(Dec 19) Scientists knew White Island was showing signs of “volcanic unrest,” but their arsenal of data and sensors couldn't prepare them for tragedy.

White Island is one of several volcanoes in New Zealand that can produce explosive, steam-driven eruptions at any time, making monitoring them a huge challenge. Data from the well-instrumented island had suggested an increased likelihood of an eruption, but nothing in the days and hours leading up to Monday afternoon had signaled one was imminent. The fatal episode underscores the sobering fact that even in the age of high-tech sensors and big data-crunching algorithms, some forces of nature still elude prediction.

13. Future trends

13.1. Top Tech Trends and Advances in 2019

https://www.technowize.com/top-tech-trends-and-advances-in-2019/

(Jul 19) Technology has made a lot of things possible. And it's entirely right to believe that the best thing happening to man is technology itself. Not even the inventions available today. New leads emerge yearly and while some are built on the existing solution, others take an entirely different path to expose the vast extent of unexploited ideas. Some of the top tech trends poised to launch this year would change the ideas we have about smartphones, legal services, computers, and health.

13.2. The Top 5 Issues Faced by Futurists

https://readwrite.com/2019/10/23/the-top-5-issues-faced-by-futurists/
(Oct 19) Technology affects every aspect of our lives. It affects the way we communicate, and how we travel, but it also determines how we learn, how we bank, and the way we run our businesses. Futurist speakers think about those changes and try to understand how they'll affect us. Here are the top five issues faced by futurists and the areas to which they're paying a lot of attention.

13.3. Gartner Top 10 Strategic Technology Trends for 2020

https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2020/

(Oct 19) Hyperautomation, blockchain, AI security, distributed cloud and autonomous things drive disruption and create opportunities in this year's strategic technology trends.

13.4. Top Strategic Predictions for 2020 and Beyond

A Gartner Special Report
https://www.gartner.com/en/doc/450595-top-strategic-predictions-for-2020-and-beyond

(Oct 19) Analyst(s): Daryl Plummer, Janelle Hill, Rita Sallam, Frances Karamouzis, Gene Alvarez, Avivah Litan, Jason Daigler, Marty Resnick, Richard Hunter, Kristina LaRocca-Cerrone, Janine Canters, Xue Bai, Emily Rose McRae, Jenna Zitmoer, and Gabriella Cerio, Brian Prentice.

Gartner's annual top 10 strategic predictions examine how the human condition is being challenged as technology creates varied and ever-changing expectations of humans. As workers and citizens see technology as an enhancement of their abilities, the human condition changes as well. CIOs in end-user organizations must understand the effects of the change and reset expectations for what technology means.

13.5. 15 awesome flying taxis and cars currently in development

These flying cars want to take your commute to new heights
https://www.digitaltrends.com/cars/all-the-flying-cars-and-taxis-currently-in-development/

(Nov 19) Commuting in the sky, George Jetson-style, might soon be within the reach of many. Some of the world's wealthiest companies are backing some of the world's brightest engineers to make flying taxis a reality sooner rather than later. The immense amount of capital needed to turn this 22nd century-esque concept into a reality is forcing automakers to forge unlikely alliances with each other. Porsche notably joined forces with Boeing to build a city-friendly aircraft.

Of course, no one is ready for flying cars quite yet. There's no infrastructure to support them, and regulations are needed to govern their use (like personal drones, but 1,000 times worse). You won't find the first vertical take-off and landing (VTOL) vehicles at a dealership. They'll be part of taxi services created to shuttle people from one part of a city to another.
So, who's working on making science fiction a reality? Let's take a look.

13.6. The Top Seven Technology Trends for 2020

https://datafloq.com/read/top-seven-technology-trends-for-2020/7231

We have reached the end of 2019 and just like in previous years, I am looking ahead to see what organisations can expect next year. 2019 was the year of truth, with many enterprises developing blockchain proof of concepts, Google confirming a quantum supremacy breakthrough and more data breaches with the latest breach containing 1.2 billion records. Now for the 8th year in a row, I offer you my technology predictions for the next year, which I hope will help you prepare for 2020.

13.7. The Most Exciting Tech Trends For 2020, From Five Leading Investors Around The World

https://www.forbes.com/sites/marenbannon/2019/11/22/the-most-exciting-tech-trends-for-2020-from-five-leading-investors-around-the-world/#2abc89bf114f

As the technology ecosystem gets more global, with breakthrough innovation popping up in cities around the world, an international perspective is more important than ever to predict the next shifts in technology. So far in 2019, venture capital deal volume is on track to reach an all-time high, largely driven by an uptick in seed stage deals and growth of international markets.

13.8. 6 predictions on where European tech is headed in 2020, according to experts

https://thenextweb.com/world/2019/11/13/6-predictions-on-where-european-tech-is-headed-in-2020-according-to-experts/

(Nov 19) 2020 is set to be a defining year for European tech. While startups and scaleups have been supported over the years through a number of EU-based programs, newly elected European Commission President Ursula von der Leyen has made achieving technological sovereignty a rallying cry for more globally competitive European tech brands.

13.9. 2020 Technology Industry Outlook

Edge computing is accelerating growth in technology

https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/technology-industry-outlook.html

(Nov 19) Cloud computing and artificial intelligence will once again dominate the technology headlines, but 2020 could be a breakout year for edge computing. Deloitte’s global technology, media, and telecommunications industry leader, Paul Sallomi, shares his perspectives on the advantages of processing data locally and how partnerships will play a key role in accelerating growth in technology.

13.10. Gartner's IT Automation Predictions for 2019

https://info.advsyscon.com/it-automation-blog/gartner-it-automation-2019

(Dec 19) Towards the end of each year, Gartner releases its predictions for the upcoming year. These predictions start a lot of conversations, get lots of coverage in the tech press, and are always useful.

13.11. Tech Trends 2020: Moving From Disruption To Transformation

https://www.forbes.com/sites/forbestechcouncil/2019/12/09/tech-trends-2020-moving-from-disruption-to-transformation/

(Dec 19) Over the past decade, the term "disrupt" became synonymous with innovation and success. A Google Trends search reveals a steady climb of the term's use throughout the 2010s to a peak in July 2019.

As the 2010s come to a close, the big question for enterprises is how to start leveraging all of this disruptive technology to create true transformation. Here are five areas of disruption that hold significant promise to move from hype to driving true value for businesses and consumers over the next decade.