KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS), ERODE – 638107

DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

IT Bulletin

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DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATIONTECHNOLOGY

IT BULLETIN **DATE: 07.12.2018**

CYBERSECURITY GOES OPEN SOURCE

The open source movement has long been a staple of the tech world with a strong push by developers and tech enthusiasts to share the knowledge they create. Innovations in connectivity such as the internet and blockchain have made it easier for open source to flourish but it has taken slightly longer to reach the cyber security sphere.

For many, open source still has a big problem when it comes to security as the publicly available code and sources mean that anyone can find workarounds to them. Currently, most developers do not have the time or infrastructure needed to effectively handle all the security issues open source code brings.

Despite this, open source is here to stay. In cybersecurity specifically, it's becoming increasingly popular as an affordable and more transparent way to operate, and although open source remains vulnerable, it may be getting safer. Companies such as WhiteSource help developers automate the process of selecting open-source components and alerting developers with real-time reports and updates on their security. With the sector becoming safer and gradually maturing, open source seems it will continue its march ahead unabated.

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IT BULLETIN **DATE: 08.12.2018**

AI-DRIVEN DEVELOPMENT

The market is rapidly shifting from an approach in which professional data scientists must partner with application developers to create most AI-enhanced solutions to a model in which the professional developer can operate alone using predefined models delivered as a service.

This provides the developer with an ecosystem of AI algorithms and models as well as development tools tailored to integrating AI capabilities and models into a solution.

Another level of opportunity for professional application development arises as AI is applied to the development process itself to automate various data science, application development and testing functions.

By 2022, at least 40% of new application development projects will have AI co-developers on their team.

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IT BULLETIN **DATE:10.12.2018**

BLOCKCHAIN

Blockchain, a type of distributed ledger promises to reshape industries by enabling trust, providing transparency and reducing friction across business ecosystems potentially lowering costs reducing transaction settlement times and improving cash flow.

Today, trust is placed in banks, clearinghouses, governments and many other institutions as central authorities with the "single version of the truth" maintained securely in their databases.

The centralised trust model adds delays and friction costs (commissions, fees and the time value of money) to transactions. Blockchain provides an alternative trust mode and removes the need for central authorities in arbitrating transactions.

"Current blockchain technologies and concepts are immature, poorly understood and unproven in mission-critical, at-scale business operations. This is particularly so with the complex elements that supports more sophisticated scenarios," said Cearley.

Despite the challenges, the significant potential for disruption means CIOs and IT leaders should begin evaluating blockchain, even if they don't aggressively adopt the technologies in the next few years.

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IT BULLETIN **DATE:11.12.2018**

QUANTUM COMPUTING

Quantum computing (QC) is a type of nonclassical computing that operates on the quantum state of subatomic particles (for example, electrons and ions) that represent information as elements denoted as quantum bits (qubits).

The parallel execution and exponential scalability of quantum computers mean they excel with problems too complex for a traditional approach or where a traditional algorithms would take too long to find a solution.

Industries such as automotive, financial, insurance, pharmaceuticals, military and research organisations have the most to gain from the advancements in QC.

In the pharmaceutical industry, for example, QC could be used to model molecular interactions at atomic levels to accelerate time to market for new cancer-treating drugs or QC could accelerate and more accurately predict the interaction of proteins leading to new pharmaceutical methodologies.

CIOs and IT leaders should start planning for QC by increasing understanding and how it can apply to real-world business problems. Learn while the technology is still in the emerging state. Identify real-world problems where QC has potential and consider the possible impact on security.

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IT BULLETIN **DATE:12.12.2018**

REAL 5G FINALLY ARRIVES

Nothing causes an argument in the mobile industry quite like 5G. For the better part of the latter half of this decade, 5G has been touted as the beginning of a truly always-on, super-fast mobile broadband connection that would replace the landline once and for all, even in fixed applications. But there's been one problem. Nobody could agree on what 5G actually was.

That changed in 2018. Now there are specification as well as actual technologies that will meet these specs. While much of this year was spent on field testing, 2019 will likely bring the first 5G-capable smartphones as well as actual service. AT&T is already rolling out standards-based 5G, and Verizon will launch service sometime in the middle of 2019, both based on mmWave technology.

T-Mobile on the other hand is using its low-band spectrum to launch 5G. While it will be slower than others, it will be more reliable as it doesn't require "line of sight" to the transmitter, a major disadvantage of mmWave. As long as its proposed merger with Sprint goes through, the company will likely be the first to offer "nationwide" 5G service especially in suburban and rural areas.

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IT BULLETIN **DATE: 13.12.2018**

AUTONOMOUS DRIVING (ROBOT CAR)

When thinking about autonomous cars the first thing to come to the mind is **Tesla** and it is a leading organization in the autonomous field which is trying to develop autonomous driving cars.

As gasoline cars are oldest type in the automobile sector, nowadays electrical cars come with a new concept in the automobile sector. Tesla is one of the excellent and stylish car makers in the world.

Autonomous Driving car is the integration of Machine Language, Artificial Intelligence advanced sensors, and processing power systems.

Tesla Motor best feature is totally an advanced technology, so it is full autonomous driving or self-driving. So this type of cars could be driven on autopilot mode.

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IT BULLETIN **DATE: 14.12.2018**

TRADERS WELCOME NEW E-COMMERCE RULES

A day after the government issued a clarification, tightening the norms for e-commerce players, the Confederation of All India Traders(CAIT) welcomed the decision and demanded that the rules be implemented with retrospective effect from April 1, 2018 so as to void the Walmart acquisition of Flipkart.

The government barred online retailers from selling products of companies in which they own a stake. They also barred online retailers from selling goods exclusively on their platforms. These rules are to come into effect from February 1,2019.

"It was under immense pressure that the government decided to frame new rules", Praveen Khandelwal, Secretary General, CAIT, told the media. It was a tough, year-long struggle for trade. They met commerce Minister ArunJaitley and key government officials to convince them of the need to ensure a leve-playing field.

"Both online and offline traders in the country will now be able to sell their goods on e-commerce platforms in a transparent maner," Mr. Khandelwal added. "Some multinational companies, which recently struck deals, should also be included in it and it [new norms] should be implemented from April 1, 2018."

A senior official in the Commerce Ministry, however, said February 1,2019 was set so as to give companies time to comply with the rules. As such, implementing them with a retrospective effect wouldnor be possible.

Empowered regulator

Mr. Khandelwal also called for the creation of an empowered regulation for the e-commerce sector.

"The decision to create a regulator is still being deliberated upon and if it is to be created, it will be done through the new e-commerce policy that we are drafting and which should be ready in a few weeks," the official said.

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IT BULLETIN **DATE: 17.12.2018**

AUGMENTED REALITY

Augmented Reality is nothing but the improved version of the vision reality and also AR is used in tablets and Smartphones.

AR improve the live view using the camera on a smartphone or tablets. While probably seen Snapchat lenses or the very famous and criticize game Pokemon Go are the examples of AR. It would come this year in 2019 with more advanced features.

The main purpose of AR application to use the smartphone or tablet camera is to show the real and virtual world. So information can be put on that view by using thin layer information like images, text.

One more technology added to this part is the **Mixed Reality (MR)** it is also known as **hybrid reality.** It combines both Augmented Reality and Virtual Reality through real the immersive technology. This technology is in the initial phase to take off with Microsoft's HoloLens. This platform introduced as part of the Microsoft Windows 10 operating system.

As technology introduces upcoming **new technology 2019 gadgets**, we need to be prepared for lots of fun and new experience.

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IT BULLETIN **DATE: 18.12.2018**

5GX FIXED WIRELESS BROADBAND EXPANDING TO DOZENS OF NEW COMMUNITIES IN MAINE

Redzone is also announcing that it has secured an additional multi-million capital commitment to expand wireless broadband to more than 25 additional rural Maine communities in 2019, expecting total broadband service availability to exceed 320,000 Maine homes and businesses. A list naming the new towns will be publically announced in January.

"While completion of Redzone's 2018 network expansion represents a significant accomplishment for Maine broadband connectivity, we recognize that too many Mainers are still without adequate broadband access in rural areas," said Michael Forcillo, Redzone Executive Vice President. While government efforts to subsidize broadband networks with public taxpayer funds appear to support technology solutions which lack economic feasibility, Redzone is actively solving the problem by increasingly delivering economically sustainable broadband access all across Maine.

Redzone Wireless, LLC began offering broadband services in 2015, and now provides affordable access high speed Internet to over 270,000 Maine households across more than 75 communities.

Redzone Wireless, LLC, established in 2014 has developed and deployed a new carrier grade fixed wireless broadband network standard. The company's 5Gx advanced multi-spectrum fixed wireless network platform maximizes coverage and capacity by operating across multiple frequency bands on a proprietary operational support system. Higher frequencies, such as millimeter wave & unlicensed 5 GHz, combine with mid-band licensed 2.5 & 3.65GHz to boost broadband speeds and non-line-of-sight performance. 5Gx fixed wireless provides an economically viable, premium broadband service alternative to wireline, fibre or cable.

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IT BULLETIN **DATE: 19.12.2018**

VIRTUAL WORKERS

For years, IT has used consultants and contract programmers to make up for staff talent shortfalls. With talent shortfalls so acute in areas like data science, analytics, security etc., there will be a continued move toward virtual workers who aren't employed by the company but who work on a retainer basis that guarantees a certain number of these specialists' hours per month to the company.

In this way, IT has guaranteed access to expert services which it might not be able to afford or gain access. It has seen data centers get greener through the implementation of virtual servers and storage, energy efficient buildings, and greener HVAC. In 2019, it is expected to see the results of early data center pilots that take the data center entirely off the energy grid, with data centers actually running its own self-contained power plants.

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IT BULLETIN **DATE: 27.12.2018**

SMART CITIES

As the technology becomes more intelligent and cheaper, integrating it into every aspect of society is only a natural step. The Internet of Things, a concept is just becoming more pivotal in the development of cities. Smart Cities will take all of the available technologies and streamline them into a seamless experience for the individual.

It will collect data and provide relevant information to assist with an individual's decision-making process. If need parking, finding a specific product or service or just turning on and off the street lights for power conservation, the IoT environment will only get bigger. Currently, there are roughly 20 cities that have a substantial action plan to incorporate this into a real-world scenario.

As the technical workforce in India is vast, and as the rest of the world adopts Smart Cities, it will find more service providers come into play to fill the void.

The government wants to develop an IoT worth $15 billion over the next six years. It is one trend that is going to happen; all just have to wait and see how it implements as time advances.

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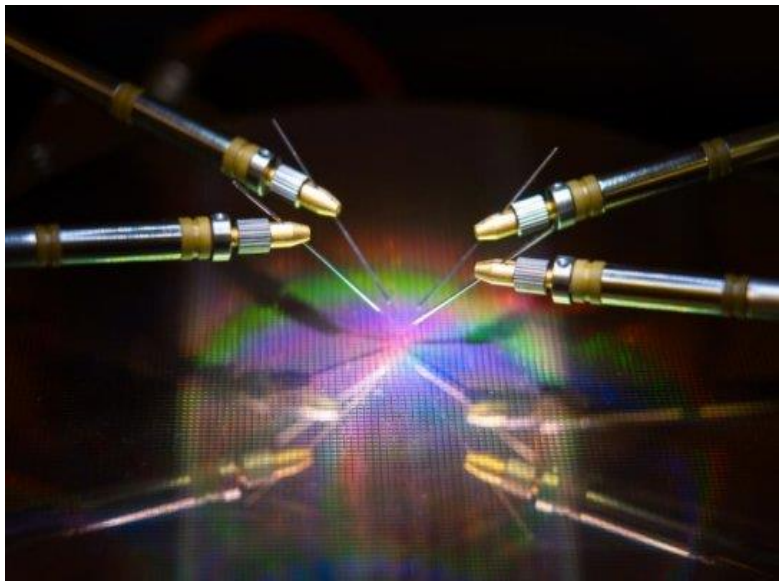
IT BULLETIN **DATE: 28.12.2018**

HARDWARE-SOFTWARE CO-DESIGN APPROACH COULD MAKE NEURAL NETWORKS LESS POWER HUNGRY

Engineers have developed a neuro inspired hardware-software co-design approach that could make neural network training more energy-efficient and faster. Their work could one day make it possible to train neural networks on low-power devices such as smartphones, laptops and embedded devices.



A UC San Diego-led team has developed hardware and algorithms that could cut energy use and time when training a neural network.

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IT BULLETIN **DATE: 29.12.2018**

MACHINE LEARNING

Another exciting emerging technology is machine learning which is essentially a computer's ability to learn on its own by analyzing data and tracking repeating patterns. For example, social media platforms use machine learning to get a better understanding of how all are connected with others in social network. They do this by analyzing our likes, shares and comments and then prioritizing content from our closest connections, serving as that content first.

How it's affecting industries: In addition to shaping our day-to-day interactions with friends on social media, machine learning is also changing the way companies do business with customers. According to Deloitte, companies like Google are using machine learning on mobile devices which can continue learning even when offline. The result? Machine learning is reshaping the way businesses interact with their customers in a big way by helping them anticipate and meet customer needs more easily.

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IT BULLETIN **DATE: 31.12.2018**

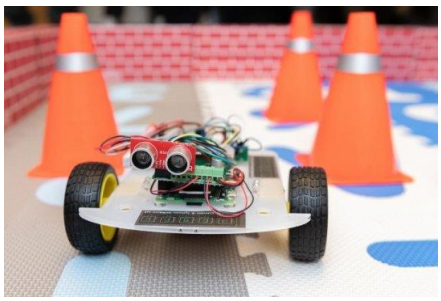
ULTRA-LOW POWER CHIPS HELP MAKE SMALL ROBOTS MORE CAPABLE

An ultra-low power hybrid chip inspired by the brain could help give palm-sized robots the ability to collaborate and learn from their experiences. Combined with new generations of low-power motors and sensors, the new application-specific integrated circuit (ASIC) which operates on milliwatts of power could help intelligent swarm robots operate for hours instead of minutes.To conserve power, the chips use a hybrid digital-analog time-domain processor in which the pulse-width of signals encodes information. The neural network IC accommodates both model-based programming and collaborative reinforcement learning, potentially providing the small robots larger capabilities for reconnaissance, search-and-rescue and other missions.

Researchers from the Georgia Institute of Technology demonstrated robotic cars driven by the unique ASICs at the 2019 IEEE International Solid-State Circuits Conference (ISSCC). The research was sponsored by the Defense Advanced Research Projects Agency (DARPA) and the Semiconductor Research Corporation (SRC) through the Center for Brain-inspired Computing Enabling Autonomous Intelligence (CBRIC).

In palm-sized robots, three major systems consume power: the motors and controllers used to drive and steer the wheels, the processor and the sensing system.

The size of the chip is reduced by half and the power consumption is one-third what a traditional digital chip would need. Several techniques were used in both logic and memory designs for reducing power consumption to the milliwatt range while meeting target performance.With each pulse-width representing a different value, the system is slower than digital or analog devices but the speed is sufficient for the small robots.



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IT BULLETIN **DATE: 02.01.2019**

NEW IT SERVICE MANAGEMENT PORTAL

Navigating the Home Page: Home page contains useful options help to find the information we need.Some frequently used and helpful services and information arehighlighted to reduce the need for manually browsing the site.

1. The Search bar

To search for specific terms such as printer, moodle or password and it will search the entire site for matches.

2. Submit a Ticket

This will allow us to browse our Service catalog and submit a ticket for help.

3. Find an Answer

To browse our Knowledge base for helpful articles on common tasks and self-help information.

4. Connect to WiFi

Everybody needs WiFi. Everybody loves WiFi. Clicking on this can help to get connected on the device quickly.

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IT BULLETIN **DATE: 03.01.2019**

ARTIFICIAL INTELLIGENCE (AI) EVERYWHERE

Consider the potential impact of AI-enabled autonomous vehicles. They could reduce accidents, improve traffic, and even slow urbanization as people can use travel time and won't need to live near city centers. "When autonomous vehicles, AI, IoT and other emerging technologies are combined with economic trends like the sharing economy, we truly see different business designs that profoundly disrupt the market," Walker says. Uber is a prime example of how a business is fundamentally shifting an industry dominated by private vehicles to potentially upending the industry with transportation as a service.

The media has been consumed with hype stories about autonomous vehicles, and it has led to inflated expectations for the technology. However, given that AI is critical for the technology, this has led to an increase in the development of machine learning algorithms. While continued advancements in sensing, imaging and mapping as well as AI and computing are helping to evolve the technology, the reality is that the complexity and cost requirements are presenting challenges.

"AI technologies will be the most disruptive class of technologies over the next 10 years due to radical computational power, near-endless amounts of data and unprecedented advances in deep neural networks," Walker says. "These will enable organizations with AI technologies to harness data in order to adapt to new situations and solve problems that no one has ever encountered previously."

Also in the realm of AI, machine learning one of the hottest concepts in technology has the potential to benefit industries from supply chain to drug research. It will soon become impossible for conventional engineering solutions to handle the increasing amounts of available data. Machine learning offers the ability to extract certain knowledge and patterns from a series of observations.

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IT BULLETIN **DATE: 04.01.2019**

IBM TO SELL SOME OF ITS SOFTWARE BUSINESS TO HCL

International Business Machines Corp, on Thursday, said it would sell some of its software products business to Indian software services exporter HCL technologies for $1.80 billion.The software products in scope represent a total addressable market of more than $50 billion, IBM said in a statement.

The company will divest seven of its products, including its secure device management product BigFix, marketing automation product Unica and workstream collaboration product connections.

"The products that we are acquiring are in large growing market areas like security, marketing and commerce which are strategic segments for HCL," said CVijayakumar, Chief Executive Officer of HCL.The transaction here is expected to close by mid-2019.

IBM's software sales, which have slowed down in the past, also weighed on its latest quarterly revenue. HCL's revenue from software services business, however, rose about 21 percent to 87.11 billion rupees, leading the company to beat its second-quarter profit.

IBM is also in the process of buying U.S.software company Red Hat Inc for $34 billion, including debt.

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IT BULLETIN **DATE: 05.01.2019**

RECOGNITION TECHNOLOGY

Recognition technology is one of the most important emerging tech trends in general but its potential uses in the hospitality industry are especially interesting. In particular, biometrics is being used to usher in a new age of seamless authentications, and this could benefit hotel processes and customer purchases.

For example, imagine if finger print or facial recognition technology could be used in our hotel to unlock rooms. Now consider the uses of the same technology for check-in and check-out purposes. In the future, this technology is also likely to allow for completely seamless purchases with payments being authenticated by touch.

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IT BULLETIN **DATE: 07.01.2019**

DATA OWNERSHIP

Fortunately, there is more good news with another new technology slowly making its entry. Thanks to distributed ledger technology, it will show a new approach to data ownership, giving control back to the original creator of content or data, instead of the platform where it was created. Not only will this empower consumers to take back control and monetise their data but it will also enable organisations to share proprietary data with competitors and industry partners without being afraid of theft or loss of a competitive advantage.

2018 will see the General Data Protection Regulation (GDPR) become enforced, changing the way how companies should protect data of European citizens. This new regulation will have a big effect on organisations, but in 2018 it will also see the launch and further development of platforms that go even further and enable secure and private data sharing. It can best be compared to each piece of data having its own vault with its own rules linked to it, governed by smart contracts. Any transaction involved with every piece of data can be tracked and monitored, and the data owner can benefit in real-time.

One solution currently in the works is the Fujitsu Data Exchange Network. This platform will enable organisations to share proprietary data with competitors without having to be concerned about revealing confidential information. Another platform revealed recently is the IOTA Data Marketplace. This data marketplace is focused on the Internet of Things devices and sensors. Applications or organisations can select a sensor across the globe, make a micropayment to the owner of the sensor and get direct access to the data stream of that sensor which can be used for data analytics or applications a revolutionary marketplace with already over 30 participants including Microsoft, Fujitsu, Orange and Accenture.

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IT BULLETIN **DATE: 08.01.2019**

DIGITAL ETHICS AND PRIVACY

Consumers have a growing awareness of the value of their personal information and they are increasingly concerned with how it's being used by public and private entities. Enterprises that don't pay attention are at risk of consumer backlash.

Conversations regarding privacy must be grounded in ethics and trust. The conversation should move from "Are we compliant?" toward "Are we doing the right thing?"

Governments are increasingly planning or passing regulations with which companies must be compliant and consumers are carefully guarding or removing information about themselves. Companies must gain and maintain trust with the customer to succeed, and they must also follow internal values to ensure customers view them as trustworthy.

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IT BULLETIN **DATE: 09.01.2019**

HIGHER EFFICIENCY IN HOSPITAL OPERATIONS

Artificial Intelligence is enabling hospital command centres to use predictive analysis for improving hospital workflow. These command centres can prioritize activities that will help provide better patient service and faster solutions. Some areas positively impacted by AI includes an ability to admit more number of patients, attend to critical cases on priority, identify patients with complex medical conditions, dispatch ambulances faster and quicken patient discharge process among others.

These solutions are just the tip of the ice-burg. AI in healthcare is showing a lot of promise and there are several new and innovative AI- based healthcare solutions that are being created on a daily basis. Hospitals, technology companies and data scientists are working together to create beneficial solutions that address real-time problems.

However, the long-term benefits are yet to be seen. Many traditional hospitals are nowhere close to incorporating these new tech solutions in their centres. How long will it take for AI to reach mainstream healthcare environments is yet to be seen.

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IT BULLETIN **DATE: 10.01.2019**

INDIA'S DIGITAL MEDIA & ENTERTAINMENT SECTOR TO SEE A TRANSFORMATIVE YEAR

Cheap 4G handsets and falling data prices led to a surge in data consumption on mobile devices last year, resulting in high user acquisitions for digital media entertainment startups.

With high-speed data connectivity finally becoming a reality in India, analysts are anticipating a transformation of sorts for India’s digital media and entertainment startup sector.

Their top predictions: a spate of consolidations among video-streaming platforms; more investments by international music apps here; and a pick-up in subscription-based and mobile advertising revenues.

Cheap 4G handsets and falling data prices led to a surge in data consumption on mobile devices last year, resulting in high user acquisitions for digital media and entertainment startups including video-streaming platforms and music-streaming apps.

“(Over-the-top or OTT) players like Amazon Prime Video, Netflix and Hotstar will only get bigger,” said JehilThakkar, a partner at Deloitte India.

But with over a dozen players in the space, one can expect consolidation and a few players exiting in 2018. Also, heavy investments by the big players in original programming and regional content will take place as subscriptions grow.

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IT BULLETIN **DATE: 12.01.2019**

ELECTRONIC HEALTH RECORDS

Electronic Health Records or EHR brought out strategic changes in healthcare, but it was not a smooth transition because problems like cognitive overload, user burnout and endless documentation caused certain limitations. But Artificial Intelligence can actually automate these routine processes and make the interfaces more intuitive.

Clinical documentation is an area that takes up so much time but with the possibility of voice recognition and dictation combined with natural language processing with a lot of time and effort can be saved. This is a major boon for doctors because information retrieval is a strong aspect in AI. And there is an even intuitive UI to make it easier for storing information.

There is also a major change in the way patients are treated. Doctors no longer need to worry about drug overdose or wrong combinations or allergies because this information will all be saved in the cloud to be relied on and acted upon at the right time.

Patients with history of various infections can also be benefited from the technology because it is now easier to identify the patterns and send notifications.

Apart from information storage and retrieval, and identification of patterns, AI can handle routine requests as well. Here are some scenarios:

- Suppose a patient has an overdue lab test, it would send notifications to the concerned patient.
- A patient is about to run out of his medication. With AI, the request for medicine refill will be sent promptly.
- Identify which patient out of many needs immediate care and prioritize them accordingly.

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IT BULLETIN **DATE: 18.01.2019**

VIRTUAL HEALTH ASSISTANCE

It is possible to raise patient engagement to the next level through the Intelligent Virtual Assistant (IVA) and the Medical Virtual Assistant (MVA). Now medical assistance has gone beyond wearables by urging patients not just to manage their goals, but also to actually help them look after their health like a real assistant would, and perhaps even more. There are health monitors and other devices that have AI incorporated in them. Here are some ways in which that can happen:

- Remind patients to take their medication at the appointed time
- Provide medical advice when they have common ailments or complaints
- Suggest diet and eating habits for people with diet restrictions
- Remind when they are about to run out of medicines and order prescriptions
- Remind them of doctor appointments and manage bookings
- Allow virtual interaction with doctors

There are chatbots that would advice a family member or caregiver to provide primary healthcare to patients who need emergency medical help at least until paramedics take over.

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IT BULLETIN **DATE: 19.01.2019**

ROBOTIC ASSISTANCE

It might not be comfortable with robots performing a surgery on person. We would feel much better on the operating table when we have a competent surgeon doing the procedures. But how about converging the skills of the competent surgeon and the technical brilliance of a robot? That makes for a surgery with impressive levels of precision, steadiness and accuracy. And when we have artificial intelligence guiding the hand of the surgeon through the help of robots, it opens the doors to extremely high levels of precision and better patient outcomes.

The AI assistant can instantly provide information on the patient's past and present health and make suggestions that would help in the diagnosis. Surgeries have become minimally invasive techniques whereby hospital stay is considerably reduced. There are surgical bots that use computer vision to perform surgeries after calculating the measurements of the human body accurately.

AI can help with surgeries of various capacities including procedures with varying levels of difficulties. And this can have huge implications on hospital stay and thereby recovery of patient. When a surgeon performs a complex surgery, AI provides him/her with real time data to identify and reduce risk, and improve quality. Highly precise movements are made the robot hands so any tremors in the surgeon's hands will be neutralized completely, enabling the progress and success of microsurgeries.

And the best part of all, the AI system will continue monitoring the patient and his health levels, long after the doctors and nurses have gone to sleep. Human restrictions will never be a problem in generating commendable patient outcome.

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IT BULLETIN **DATE: 21.01.2019**

BRIAN MICROCHIPS

Scientists did lots of hard work on Brian Microchips. It is a technology which connects human brains with the help of the microchips. As the technology changes rapidly, Brain Microchips is the combination of Computer Science and electronics. This technology connects our brains and operated by programming system and can store data with the help of microchips.

Intel was already predicted that they will be able to implement this system in 2019-2020. Now currently it is possible to put a microchip in brain and store data or neural activates conducted by this new technology. As per the survey, it is the latest technology in the world.

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IT BULLETIN **DATE: 22.01.2019**

PROACTIVE MEDICAL CARE

In traditional medical treatment, the trend was to treat the patient after the disease is detected. For example, if a patient goes to a doctor with certain symptoms, the doctor might do certain tests, and then discover the patient has cancer. Treatment like radiation and chemotherapy are started afterwards. Similarly, a patient goes to a doctor with symptoms of diabetes and the doctor does the tests before prescribing insulin shots. This kind of treatment is called reactive medical care.

With Artificial Intelligence, there has been a shift in this trend because reactive medical care became proactive medical care. In this kind of care, the patient's complete medical history is studied and high risk markers for various diseases are highlighted. At risk patients are then monitored for any change in their conditions, and if anything seems alarming enough, then the app can suggest medical intervention.

There are apps that drive the patient to be an active participant in their own health scenario. For example, the app, PeerWell encourages people to take a proactive role in their health, by saying "here are some things you can do today to improve your health and provide a good outcome", and provide suggestions.

Similarly, there are condition-specific applications for AI like palliative care, congenital heart diseases and diabetes management. The idea is to make the patient do most of the things, and avoid having to wait for a doctor to do it for them.

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IT BULLETIN **DATE: 23.01.2019**

INFORMATION TECHNOLOGY TRENDS: CURRENT STATE

Looking back at the forecasts concerning top technology trends of 2018, it is realized that they turned out to be true and those predictions became part of our reality.

Cloud computing was predicted to expand its influence. A survey by IDG depicts that in 2018, the cloud has actually come of age:

- Seventy-three percent of enterprises have at least one application or a part of their computing infrastructure already in the cloud, and 17% of respondents plan to do the same within the next 12 months.
- The average cloud budget is up from $1.62 million in 2016 to $2.2 million in 2018.
- Forty-two percent of organizations are using multi-clouds.

The number of industrial **robots** shipped in 2018 has increased by 30% as compared with 2017.

Revenue in the **smart home market** amounted to $53.235 million in 2018, which is a 42,3% increase year-on-year. Revenue in the **connected car segment** amounted to $18.438 million, up 25.9% year-on-year.

The worldwide **wearables** market is forecast to ship 122.6 million units in 2018, up 6.2% from the 115.4 million units shipped in 2017 according to the IDC.Global IT spending is expected to reach **$3.7 trillion in 2018** according to the latest forecast by Gartner.

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IT BULLETIN **DATE: 24.01.2019**

ARTIFICIAL INTELLIGENCE ON THE RISE

Over the past year, Artificial Intelligence (AI) and Machine Learning (ML) have been the headlines among emerging technologies. The next year, AI and ML will be expanding their presence in various sectors. Since numerous organizations are already planning for their development strategy to take into account artificial intelligence, all are going to see new use cases, for example:

- In the food industry, algorithms will predict when certain commodities will run out of stock and will organize timely delivery. This will support a balance between supply and demand, reducing costs.
- In manufacturing and engineering, ML will monitor the state of spare parts and predict when they need repair or maintenance
- AI assistants will penetrate homes, offices and other areas. They will be integrated into transportation systems, healthcare, finance and education.

At the same time improvements in artificial intelligence will cause some serious issues:

- Labor market reshaping (some professions may disappear, while new ones will be created)
- Security and ethics (self-driving cars may cause injury and will not be responsible)
- Data privacy (nobody can fully guarantee that artificial algorithms will not use personal data for a bad purpose)
- Taxes (it’s unclear whether companies have to pay taxes for robots that replace human workers)

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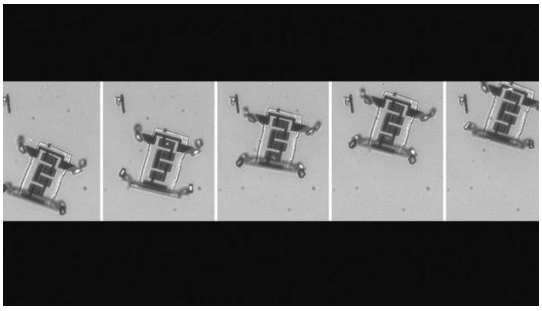
IT BULLETIN **DATE: 28.01.2019**

LEGGED MICRO-ROBOTS DESIGNED TO WALK WITHIN THE BODY

One of the latest nano-devices is a tiny four-legged robotthat could actually *walk* to its target. The technology was first developed by the University of Pennsylvania's Asst. Prof. Marc Miskin, when he was a postdoc at Cornell University. Joining him in the research were professorsItai Cohen and Paul McEuen, and researcher Alejandro Cortese.

Utilizing a proprietary multistep nanofabrication technique, batches of up to a million of the 70-micron-long robots can be produced in a matter of weeks, all of them coming from a single 4-inch (102-mm) silicon composite wafer. Each robot's body consists of an ultrathin glass rectangle topped with a layer of silicon – the electronic control components and either two or four solar cells are etched onto that layer. The legs, meanwhile, are made from a 100-atom-thick material that consists of one layer of platinum and one of titanium.



When a laser is shined onto the solar cells, the resulting electrical current is alternately applied back and forth between the front and rear legs. The application of that current causes the platinum to expand while the titanium remains rigid, thus bending each leg. When the current is switched off, though, the leg straightens back out. In this fashion, the robot is able to make its way forward.

The robots are small enough that they can actually be injected into the body via a hypodermic needle. They would currently be limited to travelling beneath a "fingernail-width" layer of tissue, however, as that's all that the external laser light could sufficiently penetrate. That said, Miskinis looking into other power sources, such as ultrasound and magnetic fields.

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IT BULLETIN **DATE: 29.01.2019**

QUANTUM COMPUTING IS REAL

It may be surprised but the performance of traditional computers is rather slow. Information technology trends 2019 say that the next generation computers will be quantum computers. They are actively maturing now and are going to significantly surpass their ancestors.

Quantum computing is a completely new way of transmitting and processing data based on the phenomena of quantum mechanics. Traditional computers use binary code (a bit) to handle information. The bit has two basic states, zero and one and can only be in one of them. As for the quantum computer, it uses qubits that are based on the principle of superposition. The qubit also has two basic states: zero and one. However, due to superposition, it can combine values and be in all these states at the same time.

Such parallelism of quantum computing helps find the solution directly without the necessity to check all the possible variants of the system states. In addition, a quantum computing device doesn't need huge computational capacity and large amounts of RAM. Imagine: it needs only 100 qubits to calculate a system of 100 particles whereas a binary system requires trillions and trillions of bits.

Developers have already learned to build quantum computing applications and will strive for their further development and widespread adoption.

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IT BULLETIN **DATE: 30.01.2019**

DIGITAL TWINS

A digital twin is a digital representation that mirrors a real-life object processor system. Digital twins can also be linked to create twins of larger systems such as a power plant or city. The idea of a digital twin is not new. It goes back to computer-aided design representations of things or online profiles of customers but today's digital twins are different in four ways:

1. The robustness of the models with a focus on how they support specific business outcomes
2. The link to the real world, potentially in real time for monitoring and control
3. The application of advanced big data analytics and AI to drive new business opportunities
4. The ability to interact with them and evaluate "what if" scenarios

The focus today is on digital twins in the IoT which could improve enterprise decision making by providing information on maintenance and reliability, insight into how a product could perform more effectively, data about new products and increased efficiency. Digital twins of an organization are emerging to create models of organizational process to enable real time monitoring and drive improved process efficiencies.

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IT BULLETIN **DATE: 31.01.2019**

DRONES

Drones also called as Unmanned Aerial Vehicles (UAVs) have no human pilot onboard and instead are either controlled by a person on the ground or autonomously via a computer program. These stealth craft are becoming increasingly popular, not just for war and military purposes, but also for everything from wildlife and atmospheric research to disaster relief and sports photography.

Drones are becoming the eyes and ears of scientists by surveying the ground for archaeological sites, signs of illegal hunting and crop damage and even zipping inside hurricanes to study the wild storms. A personal drone can be rent to soar above the horizon and snap a photo or video. Our news and features will cover developments in drone technologies, innovative uses for drones and how drone use will impact society.

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IT BULLETIN **DATE: 01.02.2019**

ALIBABA A.I. LABS LAUNCHES HOSPITALITY ROBOT

Alibaba A.I. Labs is the department leading consumer AI product development at Alibaba. Hotels have until now depended entirely on human labor. But the Labs' service robot - from delivering meals to taking laundry to guests - demonstrates what guests can expect at hotels in the future. Guests talk to the robot via voice command, touch and hand gesture and its responses are driven by AliGenie, the software that powers Alibaba A.I. Labs' smart speaker, Tmall Genie.

Alibaba A.I. Labs' robot is the next step in the evolution towards smart hotels. In addition, it is solving pain points in the hotel sector such as enhancing service efficiency with their leading AI technologies, Labs. "The robot will be the ultimate assistant for hotel guests who want everything quickly and conveniently at their fingertips."

The technology that drives the Labs' service robot is state-of-the-art, combining aluminum casing with multi-sensor data functionality and parallel computing for lightning quick responses. It also includes a semantic map, autonomous navigation system to identify obstacles, communication systems to control elevators and identity verification via facial-recognition technology.

The robot's height is less than one meter, while its walking speed reaches one meter per second. After a trial at a hotel, Alibaba A.I. Labs will assess its suitability for other areas including hospitals, restaurants and office services.

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IT BULLETIN **DATE: 02.02.2019**

FUTURE TECH CITIES

Tech brands are turning their attention to every aspect of life and reimagining these areas with tech solutions. Now Urban design is getting a rethink for a hyper-connected future.

Tech giant Alibaba is developing a City Brain artificial intelligence layer. It is testing elements of the AI in Hangzhou. Thousands of street cameras are used to collect data to control traffic lights, optimize traffic flow, detect accidents and deploy respondents.

However, constant surveillance and the data it generates have the capacity for the greater good and personal invasion of privacy.

As technology companies roll out their solutions to urban problems, privacy advocates are ringing alarm bells over the potential abuse of on-going surveillance.

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IT BULLETIN **DATE: 04.02.2019**

DATA CONNECTIVITY: HOW IOT CAN MAKE INDIAN CITIES SMART

With cheaper data plans and higher mobile penetration, many more services will be provided through cloud sourcing or a mobile-first strategy.

WinAMR measures power consumption trends in Telangana with its smart meters Indian cities and villages are set to witness a massive change. Data will be a major catalyst in driving the economy by creating experiences that surpass products and services. The result of such a shift will be smart cities and a smart economy. Connectivity is synonymous to smart cities and the technology that will bring all the services and entities in a city together is Internet of Things (IoT). A number of companies are using IoT in innovative ways to create and implement utility services such as mobility, buildings, water supply, power, and much more.

At the recent IoT Congress India conference in Bengaluru, a number of start-ups showcased their IoT work in India. Ali Hosseini, CEO, SenRa, a LoRaWAN network operator for IoT, believes that by using LoRaWAN—a protocol for low-powered devices to communicate to internet platforms—a number of services in existing cities and smart cities can be improved. Hosseini points at his project in Maharashtra where his team deployed 50 water meters during Diwali which clearly showed a three-time increase in water consumption during the holidays. The water management board could then supply the demand and also find where the demand was more and how it fluctuated.

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IT BULLETIN **DATE: 05.02.2019**

CATCHING CYBER THUGS

Microsoft has a digital crime unit which is working round-the-clock to check cyber crimes. In a significant operation earlier this month, the cyber cell of Delhi Police arrested 24 people who posed as Microsoft tech support staff and duped several US citizens.

This could not have been possible without the the real-time monitoring of cyber crimes by Microsoft's Digital Crime Unit (DCU) in Redmond that is using Cloud, Big Data, Machine Learning (ML) and Business Intelligence (BI) to improve the security of its products and services, protect vulnerable populations, fight malware and reduce digital risks.

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IT BULLETIN **DATE: 06.02.2019**

COMBINING MULTIPLE CCTV IMAGES COULD HELP CATCH SUSPECTS

Psychologists from the universities of Lincoln and York, both in the UK, and the University of New South Wales in Australia created a series of pictures using a 'face averaging' technique -- a method which digitally combines multiple images into a single enhanced image, removing variants such as head angles or lighting so that only features that indicate the identity of the person remain.

They compared how effectively humans and computer facial recognition systems could identify people from high quality images, pixelated images and face averages. The results showed that both people and computer systems were better at identifying a face when viewing an average image that combined multiple pixelated images, compared to the original poor-quality images. Computer systems benefited from averaging together multiple images that were already high in quality and in some cases reached 100 per cent accurate face recognition.

The results have implications for law enforcement and security agencies, where low quality, pixelated images are often the only pictures of suspects available to use in investigations. The image averaging method offers a standardised way of using images captured from multiple CCTV cameras to create a digital snapshot which can be better recognised by both people and computer software systems.

Their standardized face averaging method could help in suspect identification from low-quality CCTV footage where images from multiple different cameras are available, for example, from tracking a suspect along a particular route."

In the study, participants were asked to compare a high quality image with either a low quality pixelated image or one created using the image averaging method and determine whether they depicted the same person or two different people. Results showed that accuracy was significantly higher when viewing an average combining pixelated images, rather than a single pixelated image.

The same test images were run through two separate computer recognition programmes, one a smart phone application and the other a commercial facial recognition system widely used in forensic settings. Both computerised systems showed higher levels of accuracy in identifying a person from average images.

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IT BULLETIN **DATE: 07.02.2019**

MICROSOFT'S ML.NET FRAMEWORK ADDS TENSORFLOW SCORING

This capability enables use of an existing model from Google's TensorFlow deep learning and machine learning toolkitMicrosoft has refreshed its ML.Net open source machine learning framework, fitting its beta Version 0.5 with TensorFlow model scoring as a transform to ML.Net. This capability enables use of an existing model from Google's TensorFlow deep learning and machine learning toolkit in an ML.Net experiment.What's new in ML.Net 0.5

Version 0.5 begins adding support for deep learning with the TensorFlow Transform class which can take an existing TensorFlow model and get scores from that model into ML.Net. Users of this TensorFlow scoring capability do not need a working knowledge of TensorFlow internal details. The transform is based on code from the TensorFlowSharp .Net bindings.

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IT BULLETIN **DATE: 08.02.2019**

THE YEAR OF TRANSITION

The coming year will be a very exciting year. We truly live in exponential times and slowly we are climbing out of the curve of the hockey stick meaning that technologies will start to improve exponentially. Artificial Intelligence will become smarter, this time thanks to the lack of human data. We will see the Blockchain market mature and ICOs will become increasingly regulated.

Also our privacy will be breached, but help is underway in the form of Zero Knowledge Proof. In addition, slowly consumers will get back ownership of the data they create, and new marketplaces will enable sharing of proprietary data with competitors. Slowly, cloud computing will make way for edge computing and the arms race of quantum computing will result in quantum supremacy years before initially anticipated.

Finally, organisations will discover the possibilities of prescriptive analytics and thereby significantly improve their bottom line. All in all, it will be a very exciting year as we slowly move into the 4thIndustrial Revolution.

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IT BULLETIN **DATE: 11.02.2019**

3D PRINTED CAR

The latest technology inventions in 3d printing are rapidly changing how things are being made. It's an emerging technology that is an alternative to the traditional tooling and machining processes used in manufacturing. At the International Manufacturing Technology Show in Chicago, a little known Arizona-based car maker created a media sensation by manufacturing a car at the show. It was a full scale, fully functional car that was 3d printed in 44 hours and assembled in 2 days. The car is called a "Strati", Italian for *layers*, so named by it's automotive designer Michele Anoè because the entire structure of the car is made from layers of acrylonitrile butadiene styrene (A.B.S.) with reinforced carbon fiber into a single unit.

The average car has more than 20,000 parts but this latest technology reduces the number of parts to 40 including all the mechanical components.The goal here is to get the number of parts down, and to drop the tooling costs to almost zero.Cars are ridiculously complex, referring to the thousands of bits and pieces that are sourced, assembled and connected to make a vehicle."It's potentially a huge deal," said Jay Baron, President of the Center for Automotive Research, noting that the material science and technology used by Local Motors is derived from their partnership with the U.S. Department of Energy’s Manufacturing Demonstration Facility at the Oak Ridge National Laboratory in Oak Ridge, Tennessee.

This technology can use a variety of metal, plastic or composite materials to manufacture anything in intricate detail. Imagine if it could customize and personalize our new car online and pick it up or have it delivered to us the next day at a fraction of the cost of buying one from a dealership.

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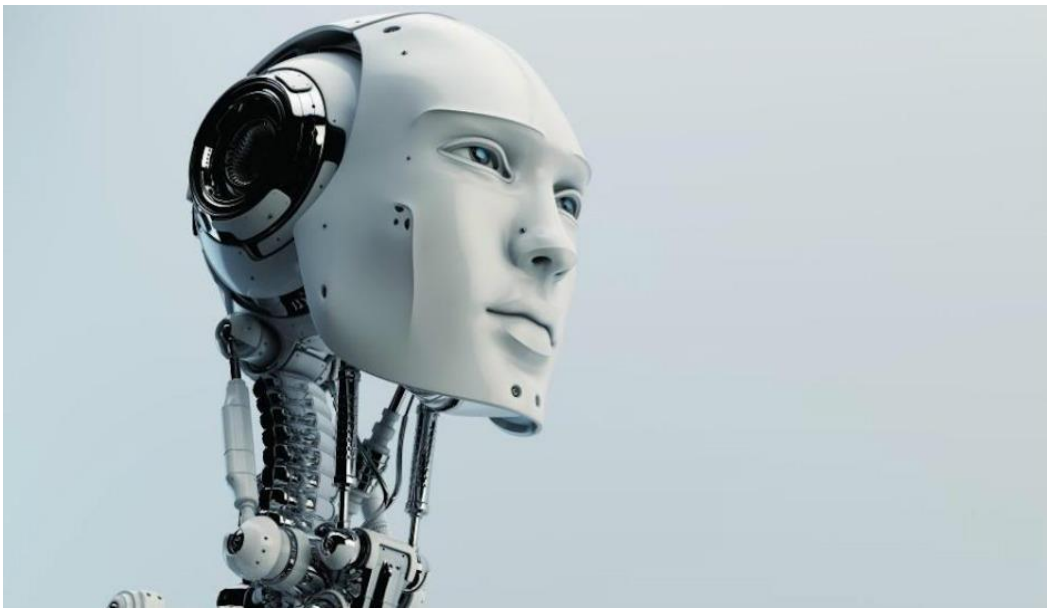
IT BULLETIN **DATE: 12.02.2019**

MICROSOFT INTEGRATES ROBOT OPERATING SYSTEM INTO WINDOWS 10



Humans have always had a fascination with robots. From being a mainstay in science fiction to aiding smooth operations of large warehouses, robots have been becoming a mainstream entity over the last few years. Given the sudden boom in robotics development, a common open-source Robot Operating System was created by Willow Garage and Stanford's Artificial Intelligence Laboratory. ROS acts as middleware and provides low-level device control and other services. Users of Microsoft Windows have had to rely on an experimental build for now, one maintained by the community but Microsoft has now announced that they will support ROS natively on Windows.

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IT BULLETIN **DATE: 13.02.2019**

SAP'S CLOUD ANALYTICS UPDATE OFFERS INSIGHTS IN SECONDS, NOT MONTHS

Improvements may make enterprises less dependent on data scientists.With a refresh of its cloud analytics tools, SAP hopes to bring users new insights into their data more quickly and take some of the workload off the IT department.

It's not that the previous analytics tools were all that slow; it's just that to get the most out of some of their features, they needed a team of data scientists to build the right reports.

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IT BULLETIN **DATE: 14.02.2019**

CARS ARE GETTING SMARTER

Driverless cars have been taking up most of the automotive industry's headlines in the past year and the sector has indeed advanced by leaps and bounds. However, the autonomous car is not the only innovation making vehicles smart. In 2019, the Internet of Things (IoT) will make it easier for cars to share and receive important data more quickly and accurately.

However, the impact of all this innovation will not be exclusively positive. Increased connectivity will also make cars easier targets for hackers and will require a serious reevaluation of the industry's security standards.

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IT BULLETIN **DATE: 15.02.2019**

BUSINESS INTELLIGENCE KEEPS LEAPING FORWARD.

The introduction of software as a service (SaaS) and other concepts such as cloud as a service and platform as a service have helped maximize business agility. More importantly, they have changed the way business intelligence works for organizations in any industry.

Now, companies such as Upsolver which provides companies with a flexible data lake warehouse provide enhanced and less resource-intensive data repositories. Cloud-based data lake platforms are built not just for the short term, but as a means for companies to future-proof their business intelligence.

Instead of filtering out data signals deemed to be irrelevant according to companies' current analysis patterns, as older warehouse solutions have done, data lakes allow complete storage of unstructured data sets so that when organizations mature and analysis models evolve, all of the information they need will still be accessible.

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IT BULLETIN **DATE: 18.02.2019**

DIGITAL PLATFORMS

With bitcoin and Ethereum constantly in the news, blockchain might seem like it's just around the corner. However, most initiatives are still in alpha or beta stage. Enterprises are still deciding how to navigate this technology but the lack of proven use cases and the volatility of bitcoin have created concerns about the viability of the technology. Long-term, Gartner believes this technology will lead to a reformation of whole industries.

Of the two types of blockchain permissionless-public ledgers and permissioned-public ledgers enterprises should look toward the latter option. Permissioned-public ledgers have access controls owned/managed by rules, but still allow for a community. For commercial transactions, companies might look to permissionless-public ledgers such as bitcoin which allows unknown or untrusted users to access the ledger.

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IT BULLETIN **DATE: 19.02.2019**

AI WILL GO MAINSTREAM

Over the past year, artificial intelligence has made the move from a mainly theoretical field into one of the hottest industries in the tech sector to date. AI has become a buzz word in the business world where the technology is being implemented in a variety of ways, causing many to take an active interest in exploring its capabilities further.

2019 will see the beginning of AI's march into the mainstream. The industry is set to produce a total of $1.2 trillion in business value in 2018 according to Gartner, and in 2019, AI will move from the business backend toward the client-facing realm.

AI assistants will become ubiquitous, improving on technologies like Alexa and Google Voice as well as taking advantage of machine learning. Instead of simply automating human tasks, AI will be used to take intelligence and knowledge further. AI will also become more accessible, with companies like Tatau which offers crowd sourced computational capacity for AI on a decentralized marketplace, emerging to deliver these noteworthy technological advances for mass market consumption.

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IT BULLETIN **DATE: 20.02.2019**

IEEE COMPUTERSOCIETY

IEEE Computer Society (IEEE-CS) tech experts unveil their annual predictions for the future of tech presenting what they believe will be the most widely adopted technology trends in 2019. This year, the experts also review additional technologies that have not yet reached broad adoption and will be revisited next year--such as digital twins--as well as technologies that have outpaced many others, including Kubernetes and Docker. The forecast by the world's premier organization of computer professionals consistently ranks as one of its most anticipated announcements.

The Computer Society's predictions, based on an in-depth analysis by a team of leading technology experts, identify top technologies that have substantial potential to disrupt the market in the year 2019. The technical community depends on the Computer Society as the source of technology IP, trends and information. IEEE-CS predictions represent our commitment to keeping our community prepared for the technological landscape of the future.

In 2019 they expect to see ever-increasing adoption of deep learning accelerators in the areas of transportation, advanced security, and technologies for humanity. Fueled by advanced materials, adoption of virtual reality and the Internet of Bodies will stretch the future to new unknowns. They are excited about their predictions and the bets have made for 2019's technology trends.

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IT BULLETIN **DATE: 21.02.2019**

ARTIFICIAL INTELLIGENCE WILL TAKE A LEAP FORWARD, WITHOUT HUMAN DATA

2017 was the year that AlphaGo Zero taught itself the game of Go and within 40 days became better than any human or artificial player ever existed. It did so without any human data as input and purely played against itself. As a result, it taught itself strategies and moves no human has ever thought of and arguably progressed the evolution of the game of Go exponentially in a very short timeframe. This achievement marks a significant milestone in the development of artificial intelligence.

In 2018, this will only continue, and will see more examples of artificial intelligence that will behave in unexpected ways, as it already did so this year. In 2017, for example, AI developers from Google built algorithms that had to compete for scarce resources, resulting in increasingly advanced strategies to beat the component. Google Brain developed algorithms that created new encryption methods, unlike any seen before, to protect information from other neural networks. Finally, Facebook had to shut down two algorithms that created its own secret language, unsolicited and used advanced strategies to get what it wanted. If one thing becomes clear from these developments, it is that artificial intelligence will be fundamentally different to human intelligence.

With the AI arms race in full swing, governments and organizations are increasing their investments in the development of ever more intelligent AI. In September 2017, Putin said that "whoever becomes the leader in this sphere will become the ruler of the world", signaling that Russia will intensify its AI activities. On the other side of the world, China aims to outsmart the USA in AI, with Europe unfortunately nowhere to be seen. The AI arms race seriously scares well-known entrepreneurs such as Elon Musk and Stephen Hawking and a solution for the existential threat of AI is still far away.

The combination of an AI arms race and developments where artificial intelligence can be trained without human data will likely result in massive steps forward in 2018. As AI becomes smarter, more money will flow into it. However, ordinary organizations as well as small and medium enterprises, are likely to miss out, as the power of AI will consolidate among just a few players and countries.

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BLOCKCHAIN WILL MATURE AND THE ICO HYPE WILL SLOW DOWN DUE TO REGULATION

Smart contracts were predominantly used for Initial Coin Offerings (ICOs) in last year. The hype around ICOs has amazed many and as of the end of November, 228 ICOs raised a total of $3.6 billion. Apart from many successes, there were also many scams and people who tried to game the system and rob people of their money.

Although the number of ICOs will continue to grow in the first months of 2018, that will also see more regulation. Slowly, governments and regulators will wake up and start to understand the impact this new way of funding has on innovation and economic growth. However, they also understand that consumers need to be protected and criminals need to be caught. Hence, there will be increased regulation in the coming year, slowing down the enormous hype of ICOs. It will see better organized ICOs, still raising millions of dollars, and the first example of these new ICOs was the Kik ICO, raising $97 million with an ICO that will pave the way for more mainstream ICOs.

Apart from more mainstream ICOs, 2018 will also see the first true blockchain applications that will be used by consumers and organizations, where those using the services not necessarily know that they use blockchain technology. After all, for Blockchain to become mainstream, it has to become as pervasive as the internet. Consumers do not know how Amazon or Facebook works, but they are more than happy to use it. That is what is required for Blockchain technology, or distributed ledger technology, to have a real impact on organizations and society.

2018 will see more applications being developed and launched, of which many of these by the companies that did do an ICO in 2017. It will move Blockchain towards maturity. Earlier, discussed seven cryptocurrencies that are worth following and forecasted the end of Bitcoin, as it is technically flawed (despite the ridiculous price increase in the past weeks, which reminds me of tulip mania in the 17th century).

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AUGMENTED REALITY AND SOCIAL MEDIA

At Facebook's F8 Conference, the company introduced the Camera Effects Platform, launching a connection between augmented reality (AR) and social media. It ignited conversations about the potential for AR in the consumer world.

However, the technology which integrates virtual enhancements with real-world objects, could have big potential for industry.

For example, instead of relying on printed paper or separate screens, AR could overlay a maintenance schematic on a broken lamp post. Enterprises should create an AR strategy in the business with specific goals and tasks for trials and benchmarks.

When it comes to transparently immersive experiences, technology is introducing transparency between people, businesses and things.

As technology evolves to be more adaptive, contextual and fluid, it will become more human-centric. Besides AR, companies should look to digital workspaces, connected homes, virtual reality and 4D printing in this realm.

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EDGE COMPUTING ENABLES INTELLIGENT NETWORKS

Edge computing is the key factor to make the Internet of Things work since connected devices will generate so much data that transmitting, storing and analysing all that data at a central location is no longer viable. Not only that, connected devices such as drones, self-driving cars or robots will, most likely, require extreme rapid processing. Creating the data, sending it to the cloud for analysis and returning the results to the device will simply take up too much time.

The predictions are that in the coming decade, it will add approximately 100 trillion sensors to our global economy, generating an unfathomable amount of data. The solution for all this data that requires rapid processing is doing edge computing; computations on the sensor itself, albeit at first this will be done on the device instead of on the sensor. Peter Levine, a general partner at venture capital firm Andreessen Horowitz, even believes that edge computing will slowly take over cloud computing. Although that might sound pretty crazy, it also seems very logical. Today, an average self-driving car produces approximately 1 Gigabyte of data per second which will likely increase in the years to come. Having to sent that data to the cloud, analyse it and return the results would simply not work.

Therefore, there will be increased attention to edge computing to enable intelligent networks where connected devices will perform the required analytics at location and use the results to perform a certain action. It will happen in a few milliseconds, instead of the few hundred milliseconds, it takes today when using cloud computing. With self-driving cars that difference can be the difference between a crash or a safe ride home. The world's cloud computing giants are not ignorant about the opportunities of edge computing. Microsoft has developed Azure IoT Edge, and Amazon recently developed AWS Greengrass. In addition, startups such as Packet and Vapor IO are also bringing cloud computing to the edges. In 2018, edge computing will find its way to connected devices before truly taking off in 2019.

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RESEARCHERS DEVELOP 128 MB STT- MRAM WITH WORLD'S FASTEST WRITE SPEED FOR EMBEDDED MEMORY

A research team has successfully developed 128MB research team has successfully developed 128MB density STT-MRAM (Spin -Transfer Torque Magneto Resistive Random Access Memory) with a write speed of 14 ns for use in embedded memory applications such as cache in LOT and AI.This is currently the world's fastest write speed for embedded memory application with a density over 100MB and will prove the way for the mass production of large capacity STT-MRAM.

STT-MRAM is capable of high-speed operation and consumers very little power as it retains data even when the power is off.Because of these features,STT-MRAM is gaining transaction as the next generation technology for application such as embedded memory, main memory and logic. Three large semi conductor fabrication plants have announced that risk mass- production will begin in 2018.

As memory is a vital component of computer system, handheld devices and storage, its performance and reliability are of great importance for green energy solutions.

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A QUANTUM COMPUTING ARMS RACE WILL LEAD TO FIRST RESULTS

In this year's hype cycle for emerging technologies, Gartner estimated that quantum computing is still more than ten years away. However, the developments in quantum computing are going a lot faster than expected. The race for the holy grail of computing is on and companies such as Google, D-Wave or IBM, universities such as Yale or UNSW or startups such as Rigetti Computing are all working on developing quantum computers. Each of these organisations has reported breakthroughs in 2017, with the latest being IBM who announced the first 50-qubit quantum processor in November 2017.

A 50-qubit quantum processor is getting closer to quantum supremacy which IBM now estimates to be at around 57-qubits. Quantum supremacy is defined as the ability of quantum computing to solve problems which can no longer be solved with the world's fastest supercomputer. Not only organisations are working on achieving this quantum supremacy, but also countries are investing billions in it. China is building the world's biggest quantum research facility. Their objective is to have a quantum computer by 2020 that has the computational power of a million times all computers in the world combined.

With several organisations aiming to reach quantum supremacy before the end of this year, there is a real arms race going on. According to Vijay Pande, a partner at venture capital firm Andreessen Horowitz, quantum computing is moving out of the science domain and into the engineering phase. Therefore, 2018 will likely see several organisations reach quantum supremacy and focus on scaling up the technology to start working on some of the world's biggest problems.

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PRESCRIPTIVE ANALYTICS WILL START TO DELIVER ON ITS PROMISES

The biggest corporates and also medium-sized enterprises started implementing predictive analytics solutions to improve their processes, customer experience and bottom-line. Although predictive analytics is a great technology, it is not sufficient in the data-driven world. For that, prescriptive analytics is needed.

Prescriptive analytics can be seen as the final stage in understanding a business. It offers recommendations on how to act upon predictions to take advantage of those predictions. It uses a variety of algorithms and data modelling techniques to have a thorough understanding of the environment and improves business performance. Prescriptive analytics leverages predictive analytics and descriptive analytics to derive ideal outcomes or to create solutions to solve our business problems. Prescriptive analytics is driving the future of Big Data.

In the past years, many organisations experiment with prescriptive analytics, but it has not reached full-scale adoption. That is changing in 2018. Already, 2017 saw a multitude of organisations developing prescriptive analytics applications, including General Electric, PopSugar (a lifestyle media company) or retailer DSW. The number of startups developing prescriptive analytics solutions is also growing and includes startups such as AIMMS, Ayata, and Profitect. In 2018, prescriptive analytics will start to deliver on its promises with the number of applications growing and more organisations benefiting from the final stage in big data analytics.

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