PUBLISHED: **6 APR 2017**

BY: **Zara Stone**

At this year's EmTech Digital conference in San Francisco, MIT Technology Review shared advances in artificial intelligence shaping the future of mobility, work and health. Highlights included off-the-shelf autonomous car systems, enterprise-boosting software and tools for patient care.

SUMMARY

BARGAIN-BASEMENT DRIVERLESS CARS Autonomous cars are poised to become more readily available to the masses. Emerging start-ups are democratising access with plug-and-play hardware, off-the-shelf sensors and affordable software solutions aimed at small businesses.

ARTIFICIAL INTELLIGENCE AT WORK Many businesses appreciate the benefits of machine learning, but lack the ability to integrate the technology into workplace operations. New start-ups are offering one-stop access to algorithmic resources that boost productivity – no data scientists needed.

DEEP-LEARNING DOCTORS Algorithmic advances are improving patient healthcare by allowing computers to diagnose diseases with greater speed and accuracy than doctors. Standout applications provide swift analysis of heart conditions and near-instant review of millions of published medical papers.

ETHICAL ANGLE Now that artificial intelligence (AI) is becoming embedded in the future fabric of our society, major tech companies – including Google, Amazon, IBM and Facebook – have created the Partnership on AI programme to ensure machines keep humans' best interests at heart.

KEY STATS

The Autonomous Evolution

> Sales of autonomous vehicles will reach 21 million in 2035, reflecting a 43% compound annual growth rate from 2025 to 2035.
>
> IHS AUTOMOTIVE, 2016

Speakers presented emerging tech for autonomous vehicles that will upend the way consumers and enterprise clients approach transport. By 2020, the autonomous vehicle industry is set to generate up to $25bn (AlixPartners, 2016).

- **Next-Gen Trucking:** "We don't want a universe where you have to choose between safety and making money," said Lior Ron, co-founder of Otto – a US self-driving truck start-up acquired by Uber in 2016. Using mounted cameras, radar and lidar sensors, Otto's AI is sophisticated enough to steer, brake and accelerate on the roads. The tech was demonstrated via a partnership with Budweiser, in which a driverless Otto truck drove 120 miles across Colorado to deliver 51,744 cans of beer.
- **Multiple Benefits:** In the US, 11% of deaths from vehicle crashes involve a large truck (IIHS, 2016). Otto is changing that, not by displacing drivers, but by giving them a co-pilot. Additionally, the vehicles will increase productivity and fuel efficiency to lower overall costs and transform an industry with a 50,000-job shortage, Ron explained. He estimates a 10-year period for full deployment. However, small business owners should not get over-excited, warned Peter Lee, corporate vice-president of Microsoft Research. "We're seeing a long gate between the conception of ideas and their broad deployment," he said.

Otto

Otto

- **Democratising Driverless Cars:** Access to new technology is often limited to the richest 1% – something Silicon Valley start-up AutoX wants to address. In March 2017, the AI-software company left stealth mode when the California Department of Motor Vehicles granted it a self-driving permit. Proving that autonomy doesn't have to mean added expense, the start-up sent a car rigged with seven $50 webcams containing custom software on autonomous trips around the San Jose area. "We want to make self-driving cars universal," said founder Jianxiong Xiao.

> Self-driving cars can impact the whole of society. Autonomous driving should not be a luxury; it should be accessible to everyone.
>
> JIANXIONG XIAO, FOUNDER, AUTOX

- **Man/Machine Partnering:** Mixing human knowledge with AI tech can speed up machine learning. US start-up Drive.ai is using this approach to compete with more established companies in the autonomous driving space, such as Google and Uber. The start-up combines deep learning with human annotation when processing street data, taking advantage of both for a better output. "The pipeline is [the] infrastructure, to take all this data and get value from it," explained chief executive Sameep Tandon. Drive.ai has also built roof rack-style hardware that can make any car autonomous. The company is concentrating on enterprise use cases. "We call this the three Ps: building the delivery of packages, pizza and people," said president Carol Reiley.

AutoX


AutoX

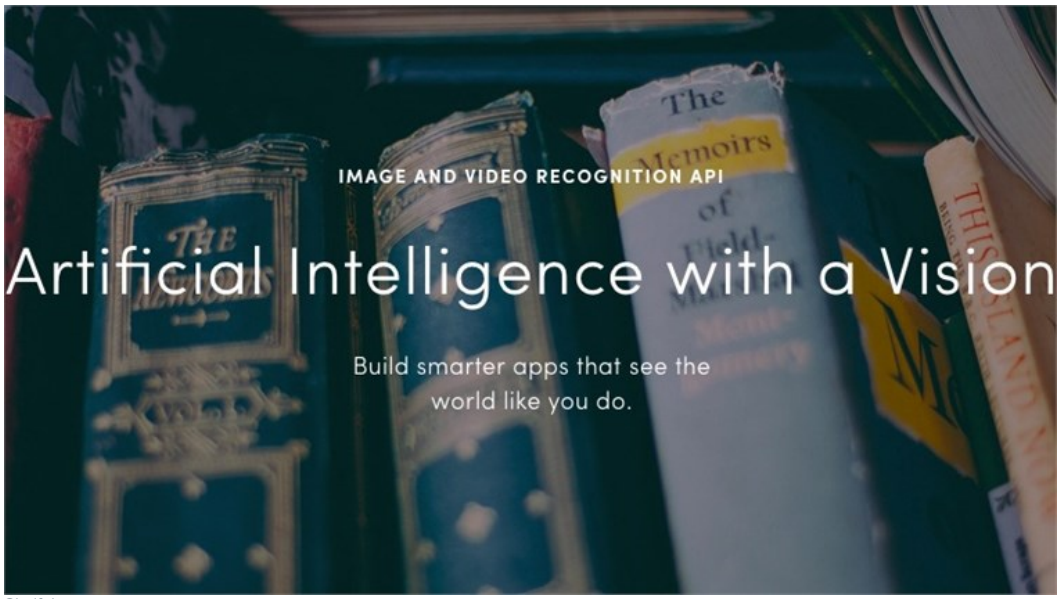
Workplace Upgrade

AI innovations are impacting the way companies do business, radically boosting both efficiency and output. Currently, 63% of global consumers don't realise they're already using AI technologies, which suggests an easy adoption and adjustment period for workers (HubSpot, 2017).

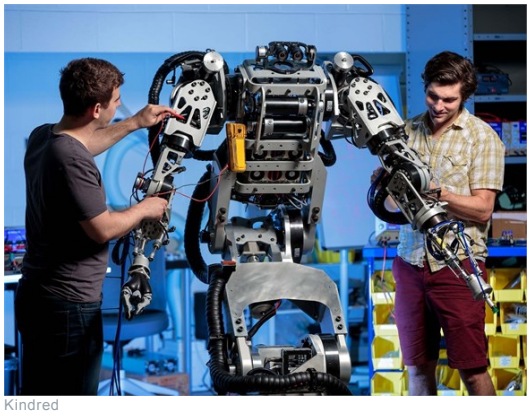
- **Super Software:** The software-as-a-service (SaaS) industry will surpass $151bn by 2020 (IDC, 2016). This translates into a lot more data stored in the cloud, but as much of this data is duplicated and disconnected, companies are missing out on valuable customer insights. In February 2016, US machine-intelligence company Gamalon released two tools that address this: Gamalon Structure, which converts paragraphs into structured data, and Gamalon Match, which de-duplicates and correlates data rows. They work by using Bayesian Program Synthesis, a new type of machine learning that's faster than previous options. US government agency Darpa has invested $7.2m in research and development contracts with Gamalon.
- **Better Customer Care:** US customer relationship management company Salesforce's approach is building and acquiring solutions for its new in-house AI software Einstein, unveiled in late 2016. Einstein adds value to existing data, from predictive lead scoring to natural language processing. Salesforce also partnered with IBM's Watson AI business, which means its subscribers can combine their customer data with Watson's huge data repository, including finance, insurance and healthcare services. "Don't think of AI as its own industry," said John Ball, senior vice-president for Salesforce Einstein. "It's always AI plus X, a specific dataset."

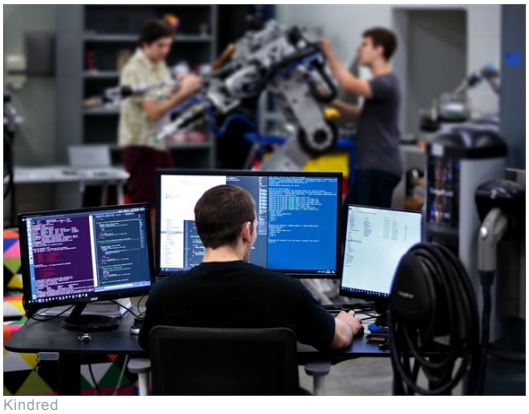

The software-as-a-service industry will surpass $151bn by 2020

- **AI for Beginners:** Given businesses' desire to weave AI into services, developers are offering one-stop solutions for companies without data science teams. New York-based start-up Clarifai does the heavy lifting for companies looking to integrate visual search by ingesting their media files (images and video) and tagging them in real time. Its database is smart enough to label a sweater as 'turtleneck', identifying both style and colour. The front end of the visual search engine is simplified for customers to use and clients include BuzzFeed, Trivago and AOL. "Humans can do a little bit of work and apply it to massive amounts of data," said chief executive Matthew Zeiler. The company has raised $41.25m in venture capital funding so far.
- **Shop-Bot Assistance:** Globally, 41% of shoppers want same-day delivery, yet just 14% of stores are equipped to deliver this (Accenture, 2016). Robots are the solution to rising consumer demand for instant gratification, according to George Babu, co-founder of US AI and robotics company Kindred. At Kindred, robotic arms dexterously sift, sort and stack items for shipping, using human-aided reinforcement learning to correct mistakes, leading to higher accuracy. "We created an architecture that [has] humans and machines working side by side," Babu said. "We have a human remotely do the parts of the job that the [machines can't]." The company is currently focused on e-commerce, but warehouse supply chains are also on its radar. "In two years, we won't need humans to be present as often for profit margins to go up," Babu said.



Clarifai

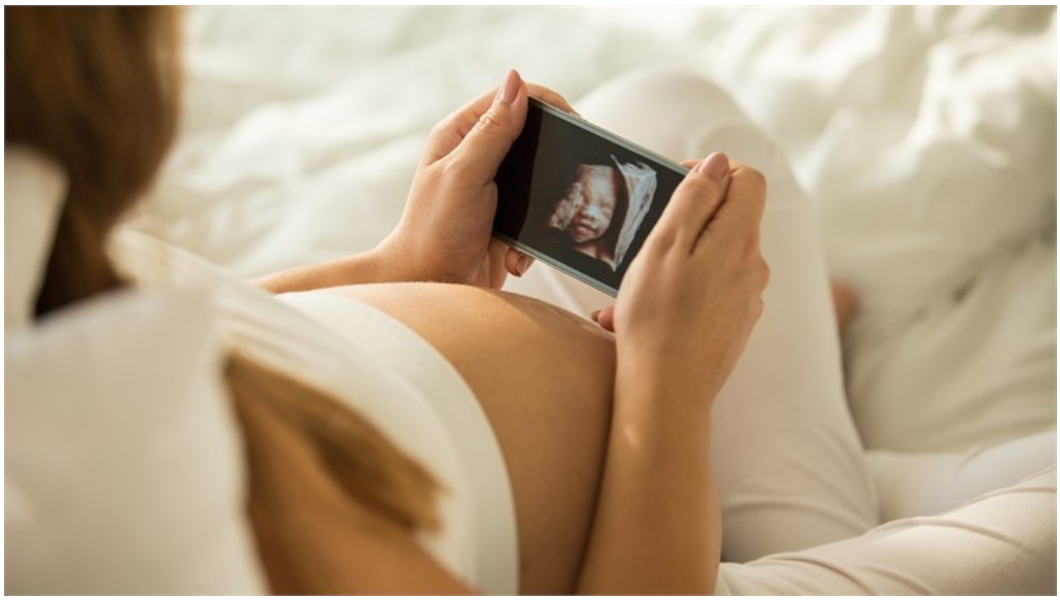

Kindred


Kindred

Medicine Machines

Medical providers are using increasingly sophisticated AI and integrating image analysis through machine learning into their practice to improve patient care.

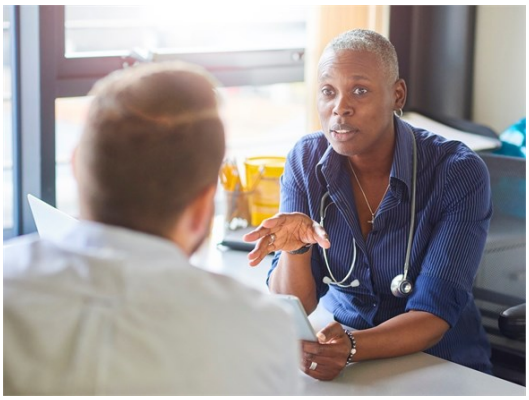
- **Efficient Clinicians:** Keeping track of the 50 million scientific papers published is impossible for doctors, but an ideal task for deep learning, said Dario Gil, vice-president of science and solutions at IBM Research. Machines can assess both structured and unstructured data faster than a doctor, and they can create outcome simulations for favourable results. This is dramatically accelerating specialists' productivity and progress.
- **Tech-Tailored Treatment:** Currently, Watson – the AI of IBM's supercomputer – is helping 24 organisations to increase disease discovery rates by providing medical imaging services that evaluate scans of the body. During trials at the University of North Carolina School of Medicine, Watson provided treatment plans for 1,000 patients that matched oncologists' recommendations in 99% of cases. Some 30% of its suggestions were based on analysis of recent papers the doctors had not yet read.
- **Start-Up Solutions:** Low-cost, highly sensitive medical tools that can operate without specialists are proliferating, thanks to advances in machine learning. Butterfly Network in the US has designed a smartphone-sized ultrasound machine that uses algorithms to help inexperienced clinicians capture and analyse medical images. This could address the shortage of experienced professionals in developing countries by offering a simpler way to assess patients.



Smartphone-sized ultrasound machines are using AI to provide better medical care

- **Instant Prognosis:** FDA-approved Arterys is a cloud-based medical-imaging platform that uses AI to quantify blood flowing through the heart. The service can produce answers within 15 seconds, compared to the 30 to 60 minutes doctors need. In 2016, the company teamed up with global medical equipment manufacturer GE Healthcare to launch the first commercial application in nine test hospitals. "Clinicians are excited about the efficiency this can bring to their work," said Kimberly Powell, senior director of deep learning at US tech company Nvidia. "They're all feeling overworked and spending less time with their patients."
- **Deep-Learning Diagnosis:** A forward-thinking approach to healthcare management is identifying high-risk patients before they show symptoms. Researchers at New York's Icahn School of Medicine at Mount Sinai created Deep Patient, a tool that uses deep learning to analyse records and determine at-risk patients. It was trained on 700,000 patient details over 12 years and can precisely predict a person's risk for diabetes, heart failure and cancer. "Electronic health records have been locked up and inaccessible for far too long," said Powell.
- **Fast & Accurate:** Machine vision in diagnoses is the future of medicine, according to Martin Stumpe, technical lead manager at Google Research. "The cost of breast cancer in the US is $11bn a year and one in 12 biopsies are misdiagnosed," he said. "With the tools we are using, a technician can upload an image and get a diagnosis in a few seconds." A March 2017 report from Google on using machine learning for biopsy analysis revealed its AI-containing computer had an accuracy detection rate of 89%, whereas a pathologist scored 73%.

AI tools can predict a person's risk for diabetes, heart failure and cancer



Clinicians are welcoming AI tools that make their jobs easier

FUTURE INSIGHTS

REASSURE STAFF The transition to an AI-directed future might create pushback from employees uncertain about their roles. Ease the introduction by educating on the benefits of the tech and clearly defining the divide between staff and machine tasks.

EMBED ETHICS Consumers are excited about AI's potential, but concerned about the moral dilemmas created by a world run on machine learning. Brands should create a public company policy on AI ethics for transparency and trust. "There's an ethical imperative to harness AI to protect and preserve," says Microsoft Research's Eric Horvitz.

MAKE NEW ROAD RULES It's time "[for the] industry to think about standards of autonomous driving", says Carol Reiley, president of Drive.ai. With an estimated 21 million self-driving cars on the roads by 2035, early legislators in this space can help establish a safe transition into a future where autonomous cars are commonplace.

IDENTIFY AI OPPORTUNITIES As enterprise AI becomes more affordable, the small-business market will have new opportunities for growth – from autonomous delivery trucks, to streamlined inventory controls and instant customer data analysis.

TOPICS: Automotive & Transport | Consumer Electronics | Digital Worlds | Science & Technology | Work | Wraparound Wellness

Stylus Media Group
London | New York
T +44 (0) 203 837 8300 (UK)
T +1 (646) 665 3501 (US)
E innovation@stylus.com

@Stylus_LIVE


instagram.com/wearestylus


bit.ly/stylusgroup


stylus.com/rss.xml

About Stylus

Stylus is a global innovation research and advisory firm, which works with businesses to stimulate innovation and growth. Our team of researchers identify and analyse the latest consumer lifestyle, product design and customer engagement trends across 20+ industries. The reports we publish provide commercial insight for 300+ global brands and agencies, making Stylus an essential resource for professionals in innovation, planning, strategy, product design and marketing roles.