



# Artificial Intelligence

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**Active is: Investing in the future**

## THE FUTURE IS NOW

**Artificial Intelligence (AI) is already becoming a part of our everyday lives. Upcoming innovations will not only integrate the technology more seamlessly, but usher in new products and services that will enhance our lives. More companies every day are exploring how they can use AI to improve their products and experiences, enhance efficiency, and drive competitive advantages. While future innovations will be exciting, here are just some of the ways AI is already being used today:**

### Voice assistants<sup>1</sup>

Through mobile devices and smart speakers, AI-powered voice assistants have changed the way we interact with technology. While the smartphone virtual assistant was first introduced in 2011, advancements in AI algorithms and an explosion in the amount of voice data available for training have resulted in speech recognition accuracy rates that now exceed human levels. Currently, most voice recognition systems transmit the speaker's voice over the internet where it is interpreted by powerful computers in the cloud and then transmitted back to the device. Unfortunately, this results in a delay that impedes the ability of humans to have natural conversations with smart devices. To eliminate this delay, companies are now leveraging AI-dedicated processors and software directly on the device, so that speech recognition can occur in real time and even without being connected to the internet. Modern methods of speech recognition include Deep Learning and Recurrent Neural Networks (RNNs), which contain feedback loops to exploit the fact that certain sounds are more likely to follow other sounds. One company's virtual assistant already has over 80,000 skills and can communicate with over 28,000 devices.

### Key takeaways

- The technological underpinnings of AI are developing rapidly with new breakthroughs seemingly every day.
- The global economy is just beginning to see the impacts of AI and advanced automation on society, and these impacts will be transformative.
- AI will disrupt business models, drive the next wave of innovation, and change how we live and work.
- AI enables companies to do more with fewer resources, to streamline business processes, and to improve product quality while driving better profitability.

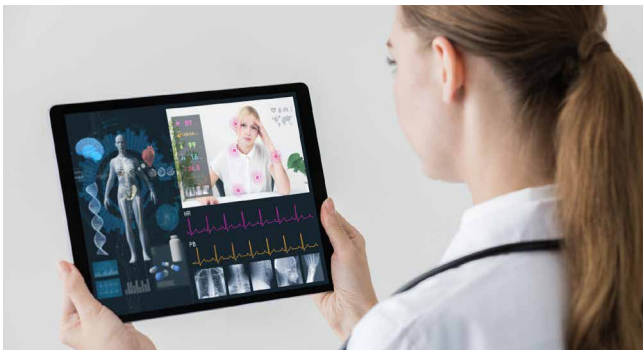


## The future is now



### Smart home<sup>2</sup>

Speech recognition, computer vision, machine learning, and predictive analytics have combined to infuse many home appliances with intelligence. Some examples include video doorbells, lights, window shades, televisions, fans, multicookers, thermostats, vacuums, air purifiers, speakers, facial recognition security systems, and door locks. Self-learning thermostats help to save energy by learning a person's schedule and temperature preferences using motion sensors, thermal sensors, mobile phone location, and live weather data. Rather than alert the homeowner every time motion is detected, AI security cameras can distinguish between pets and humans, recognise trusted faces, and even automatically zoom in to capture clear pictures of intruders.



### Healthcare<sup>3</sup>

The healthcare industry is undergoing a digital transformation that is enabling AI to help optimise treatments, improve medical diagnosis, and increase doctor productivity. One health management company is training AI with data from over 100 million members to predict common health issues before they occur. Another company has created an AI-powered app that trains on individual patient data from various sources such as lab-work and daily fitness trackers to generate personalised health insights and recommendations. Patients are often unable to visit doctors in a timely manner due to a shortage of physicians, busy schedules, or the high cost of emergency medicine. Several companies are now addressing these issues by connecting patients directly with doctors through mobile video and intelligent applications to get faster diagnoses and medicine delivered within hours.



### Intelligent cities<sup>4</sup>

AI is enabling modern cities to meet the most pressing demographic, economic, environmental, infrastructure, and social challenges. For example, over the past couple of years, some cities in Asia have deployed AI to solve the increasing challenge of traffic congestion. One company combines traffic camera and vehicle GPS data to comprehensively assess traffic conditions citywide and optimise traffic lights in real-time to keep traffic flowing. The result is lower commute times for millions of workers and faster response times for emergency services such as ambulances and fire trucks.



### Vehicle safety<sup>5</sup>

AI has made possible myriad new safety features in vehicles collectively known as Adaptive Driver Assistance Systems (ADAS). ADAS can self-park, provide collision avoidance, automate lighting, incorporate traffic warnings, alert drivers to other cars or pedestrians, summon vehicles from garages or parking spots, detect speed limit signs, and more. To take full advantage of modern ADAS systems, every year vehicle manufacturers are incorporating more sensors and cameras to support front view, surround view, rear view, and driver monitoring. Significant progress has also been made toward fully autonomous vehicles, which, when available, could transform the transportation and automobile insurance industries.

## The future is now



### Fraud detection<sup>6</sup>

Financial companies are using AI and machine learning to help mitigate the USD 24 billion in fraud losses experienced annually in the global payments ecosystem. More than 1 billion daily non-cash transactions globally attract constantly evolving fraud schemes that require companies to deploy and train numerous machine learning models. Machine learning provides the speed, scalability, and efficiency necessary to perform effective fraud analysis using methods such as logistic regression, decision trees, random forests, and neural networks. One payments processor manually checks just 0.05% of transactions for questionable activity, while machine learning algorithms assess the risks of the remaining 99.95%.



### Chatbots<sup>7</sup>

Companies are achieving significant cost reductions by replacing human customer service employees with AI powered virtual agents, commonly known as chatbots. Chatbots are available 24 hours a day and are often deployed through websites and mobile apps to help answer simple questions in real time about a company's products, services, or policies. If more complex assistance is required, the chatbot can seamlessly hand off the conversation to a human. Chatbots can also use voice recognition to answer similar questions over the phone and connect a human if necessary. By incorporating data such as location, login status, and activity history, chatbots can personalise their responses to create a more useful and conversational interaction.



### Video games<sup>8</sup>

AI personalises and enhances the gaming experience with self-learning non-player characters that behave more like humans. Using machine learning, games learn the skill level of human players and then present opponents of comparable skill. AI also creates realistic game content such as levels, characters, stories, weapons, and more. One method utilised is Generative Adversarial Networks (GANs), which consists of one deep neural network creating new content and then a second "adversarial" deep neural network evaluating whether that new content is realistic enough.



### Personalised websites<sup>9</sup>

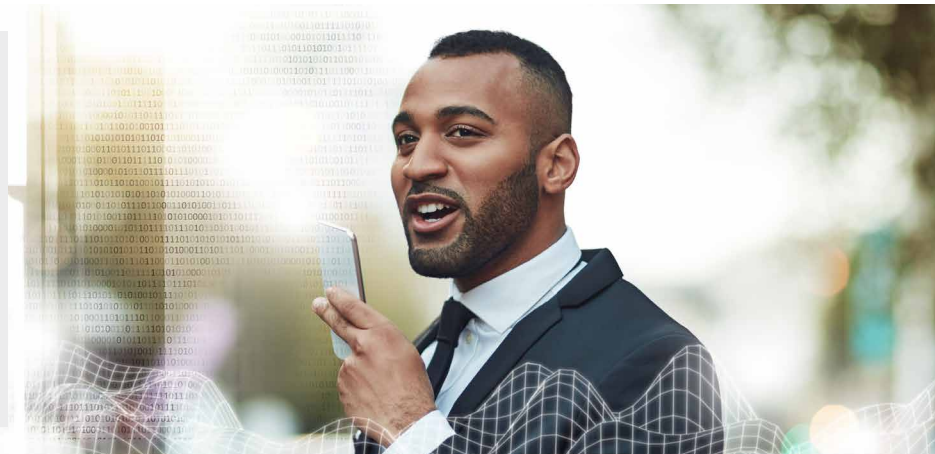
AI makes mass customisation of websites possible so that every visitor has a unique experience. On e-commerce websites, pages are automatically redesigned based on how the visitor has moved through the website; the longer the visitor browses, the more customised the results become. Video streaming services deploy AI to adapt the entire user experience to each individual subscriber, including the movies and shows displayed on the homepage, the visuals presented for each movie, and the recommendations for content to watch. Websites that provide user-generated reviews use AI to surface the most relevant photos, videos, and reviews. This new era of personalisation requires many AI tools including computer vision to identify photos and videos, natural language processing and sentiment analysis to understand user-generated content, and machine learning and predictive analytics to build customer profiles and model product preferences.



## The future is now

### The era of AI is just getting started

We are still at the beginning phases of a global transformation that will be ushered in by developments in artificial intelligence. We're still very early in the development curve – in the midst of first generation devices and features with glimmers of next-generation capabilities emerging.



#### Sources:

- <sup>1</sup> <https://www.temi.com/blog/speech-recognition-accuracy-history/>  
<https://venturebeat.com/2018/10/22/researchers-develop-offline-speech-recognition-thats-97-accurate/>  
<https://www.zdnet.com/article/move-over-siri-alexa-googles-offline-voice-recognition-breakthrough-cuts-response-lag/>  
<https://voicebot.ai/2019/01/31/amazon-announces-80000-alexa-skills-worldwide-and-jeff-bezos-earnings-release-quote-focuses-solely-on-alexa-momentum/>  
<https://ai.googleblog.com/2019/03/an-all-neural-on-device-speech.html>
- <sup>2</sup> <https://developer.amazon.com/blogs/alexa/post/b46d8c0a-acf8-4360-9efc-59d314847d8b/amazon-alexa-at-ces-20191>  
<https://roboauthority.com/how-nest-learning-thermostat-work/>  
<https://reolink.com/ai-security-cameras-guide/>
- <sup>3</sup> <https://www.businessinsider.com/how-unitedhealth-groups-optum-is-applying-artificial-intelligence-to-its-data-2018-8>  
<https://anthem.ai/>  
<https://doc.ai/>  
<http://www.pahtg.com/en/about-us/company-overview/>
- <sup>4</sup> <https://www.cnn.com/2019/01/15/tech/alibaba-city-brain-hangzhou/index.html>  
<https://www.alibabacloud.com/et/city>  
<http://www.bbc.com/future/story/20181212-can-artificial-intelligence-end-traffic-jams>
- <sup>5</sup> <https://www.onsemi.com/PowerSolutions/content.do?id=19045>  
[https://en.wikipedia.org/wiki/Advanced\\_driver-assistance\\_systems](https://en.wikipedia.org/wiki/Advanced_driver-assistance_systems)
- <sup>6</sup> J.P.Morgan Payments Market Share Handbook Tenth Edition, 10 May 2019  
Square Investor Day presentation, 16 May 2017  
Capgemini World Payments Report 2018  
<https://aws.amazon.com/solutions/case-studies/fraud-dot-net/>  
<https://www.marutitech.com/machine-learning-fraud-detection/>
- <sup>7</sup> Acquisdata Artificial Intelligence Software Industry, 22 April 2019  
<https://www.twilio.com>
- <sup>8</sup> <https://www.pcgamer.com/ea-reveals-project-atlas-a-game-platform-built-on-ai-and-cloud-computing/>  
<https://medium.com/aifrontiers/an-overview-of-artificial-intelligence-for-video-games-f491229c0e7d>  
<https://rctom.hbs.org/submission/activision-blizzard-atvi-using-machine-learning-for-videogames-development-and-community-moderation/>
- <sup>9</sup> <https://www.linkedin.com/pulse/how-netflix-uses-ai-data-conquer-world-mario-gavira/>  
<https://www.phocuswire.com/TripAdvisor-plots-social-network>  
[https://help.salesforce.com/articleView?id=mc\\_pb\\_personalization\\_builder.htm&type=5](https://help.salesforce.com/articleView?id=mc_pb_personalization_builder.htm&type=5)

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