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ATLANTIC CAPITAL MARKETS



# AI.. THE NEXT BIG BOOM

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## THE AI BOOM IS COMING AND FOUR KEY STOCKS THAT WILL BENEFIT.

### WHAT IS ARTIFICIAL INTELLIGENCE (AI)?

Back in the 1950s, AI was first described as any task performed by a program or a machine that, if a human carried out the same activity, we would say the human had to apply intelligence to accomplish the task. This explanation was first coined by Marvin Minsky and John McCarthy.

Marvin Minsky was an American cognitive scientist concerned largely with researching AI, he was co-founder of the Massachusetts Institute of Technology's AI laboratory. John McCarthy was an American computer scientist and cognitive scientist. He first coined the phrase Artificial intelligence and spent most of his career at Stanford University. The pair are largely dubbed "the fathers of Artificial Intelligence".

AI systems do demonstrate some human like behaviours such as problem solving, knowledge representation, planning, learning, reasoning, perception, motion, and manipulation.

### HOW WILL AI CHANGE THE WORLD

Robots, virtual assistants and driverless cars are the most prominent applications in use during our day to day lives. The desire for robots to be able to act autonomously and understand and navigate the world around them means there is a natural overlap between robotics and AI. While AI is only one of the technologies used in robotics, use of AI is helping robots move into new areas such as self-driving cars, delivery robots, as well as helping robots to learn new skills.

## AI Applications

### Virtual Assistants

One of the most visible manifestations of the rapid progression of AI has been the rise of virtual assistants, such as Apple's Siri, Amazon's Alexa, the Google Assistant, and Microsoft Cortana. While Apple's Siri may have come to prominence first, it is Google and Amazon whose assistants have since overtaken Apple in the AI space -- Google Assistant with its ability to answer a wide range of queries and Amazon's Alexa with the massive number of 'Skills' that third-party developers have created to add to its capabilities. As well the ability to recognise who and what is in a photo, filtering spam, or detecting credit card fraud.

### Facial recognition and surveillance

In recent years we have also seen huge improvements in the accuracy of facial-recognition systems, to the point where Chinese tech giant Baidu says it can match faces with 99 percent accuracy, providing the face is clear enough on the video. While police forces in western countries have thus far only trialled using facial-recognition systems at large events, in China the authorities are mounting a nationwide program to connect CCTV across the country to facial recognition. They will then use AI systems to track suspects and suspicious behavior and are also trialling the use of facial-recognition glasses by police.

## Healthcare

AI could eventually have a dramatic impact on healthcare, helping radiologists to pick out tumours in X-rays, aiding researchers in spotting genetic sequences related to diseases and identifying molecules that could lead to more effective drugs.

There have been trials of AI-related technology in hospitals across the world. These include IBM's Watson clinical decision support tool, which is trained by oncologists at Memorial Sloan Kettering Cancer Centre, and the use of Google DeepMind systems by the UK's National Health Service, where it will help spot eye abnormalities and streamline the process of screening patients for head and neck cancers.

## Autonomous Vehicles

Autonomous vehicles could well be the most controversial application for AI at the moment. The moral dilemma and general concerns for trusting a vehicle to drive you are one of a couple of issues, but equally the technology is still in early stages. Alphabet's Waymo and Uber are well on the way to launching driverless taxi's. Uber have been spending the last year clocking up millions of test miles with its own fleet of self-driving vehicles.

General Motors recently said it would build a driverless car without a steering wheel or pedals by 2019, Ford committed to doing so by 2021, and Waymo, the self-driving group inside Google parent Alphabet, will soon offer a driverless taxi service.

## At the top level AI falls into two categories

- Narrow AI
- General AI

### WHAT CAN NARROW AI DO?

Narrow AI is what we see all around us in computers today: intelligent systems that have been taught or have learnt how to carry out specific tasks without being explicitly programmed how to do so.

This type of machine intelligence is evident in the speech and language recognition of the Siri virtual assistant on the Apple iPhone, in the vision-recognition systems on self-driving cars and in the recommendation engines that suggest products you might like based on what you bought in the

past. Unlike humans, these systems can only learn or be taught how to do specific tasks, which is why they are called narrow AI.

There are a vast number of emerging applications for narrow AI: interpreting video feeds from drones carrying out visual inspections of infrastructure such as oil pipelines, organizing personal and business calendars, responding to simple customer-service queries, co-ordinating with other intelligent systems to carry out tasks like booking a hotel at a suitable time and location, helping radiologists to spot potential tumours in X-rays, flagging inappropriate content online, detecting wear and tear in elevators from data gathered by Internet-of-Things devices, the list goes on and on.

### WHAT CAN GENERAL AI DO?

Artificial general intelligence is very different and is the type of adaptable intellect found in humans, a flexible form of intelligence capable of learning how to carry out vastly different tasks, anything from haircutting to building spreadsheets, or to reason about a wide variety of topics based on

its accumulated experience.

This is the sort of AI more commonly seen in movies, the likes of HAL in 2001 or Skynet in The Terminator, but which doesn't exist today and AI experts are fiercely divided over how soon it will become a reality.

## Hot Stocks in the sector

### Renalytix

Possibly one of the hottest prospects in the sector. The company was founded by James McCullough and Julian Baines, Last year they began collaborating with Mount Sinai, an American hospital group, with eight hospitals, millions of patients and a worldwide reputation for medical research.

The business is based in New York, mainly because more than 40 million Americans have chronic kidney disease and the US spends almost £90bn a year treating it. Numbers are also increasing, as kidney disease is closely linked to diabetes, one of the fastest growing illnesses in the world.

Renalytix have a product called KidneyIntelX, focused initially on diabetics, to calculate, which of them are most at risk of ending up with advanced kidney problems. Doctors simply take a blood test and send it to the Renalytix lab. The company assesses the blood test, alongside data gleaned from hundreds of thousands of health records. The results produce a prognosis for individual patients and those most at risk can begin preventative treatment.

City brokers have high hopes for Renalytix. The company is forecast to deliver revenues of \$3.7m in the year to June 2020, soaring to \$19m in 2021. Currently loss-making, the firm is expected to become profitable from 2021 if not earlier.

### Alphabet (GOOG)

Google CEO, Sundar Pichai, refers to the company as "AI first." AI has become ingrained across the product line, being built into various applications such as with Gmail, YouTube, Maps, Photos, Google Cloud and so on. The company has also developed its own assistant, which connects with more than 5,000 devices in the home.

Google is also a top player in autonomous vehicles. The company's Waymo unit could be worth as much as \$175bn, according to analysts at Morgan Stanley.

Finally, the valuation of GOOG stock is at reasonable levels, with the forward price-to-earnings ratio is 27X, which is in-line with other mega tech operators like Microsoft. This puts it at the top of the heap among artificial intelligence stocks.

### Nvidia

Their graphics processing unit (GPU) technology enables AI in self-driving cars, gaming, the cloud, Big Data and many other areas. Some hesitation comes from their recent sales plunge of 24% in the most recent quarter, but experts say that they should see some sharp improvements from there and hold steady in 2020.

Nvidia share price is highly volatile and goes to show that the sector overall is still really in its early stages and prone to big swings on news flow. In the coming few weeks, the focus will shift back to the progress on the on-going trade tensions between U.S. and China as NVDA is one of the U.S. key semiconductor firms that its operations will be affected significantly if the trade tensions continue to escalate.

CUDA is a programming interface for turning Nvidia graphics processors into math accelerators for neural network applications, simulations, and other vector-intensive software. Nvidia's automotive and Internet-of-Things development boards, that feature a mix of Arm Cortex CPU cores and Nv CUDA-based GPU engines, will know Nvidia already develops and distributes Arm-compatible CUDA libraries and toolkits. Arm support is already there for CUDA.

## **Baidu (BIDU)**

Chinese internet company Baidu Inc the "Google of China", has been investing heavily in AI. Baidu spent \$2.9bn on R&D in just 2.5 years, with most of this going to AI. The money has funded a 1,700 strong research team and four separate research labs. Crucially, Baidu has an AI advantage because of the huge data it gains from its 665m monthly search engine users.

When it comes to the search business, Baidu remains the king in China. Over the years, the company has transitioned to mobile, which has been critical. But they have also invested heavily in becoming one of the serious artificial intelligence stocks. This has helped with personalizing the search experience as well as improving the impact of online ads.

The AI efforts have been paying off. In the latest quarter, revenues jumped by 27% to \$4.1bn and the adjusted EBITDA came to \$988m — or about 24% of total revenues, giving the company a highly scalable business model.

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