

What you need to know about AI in Scotland



What is AI?

AI is a set of techniques used to allow computers to perform tasks that normally need human intelligence, such as visual perception, speech recognition, translation between languages and decision-making.

“Our vision is to use Scotland’s data to its full potential by driving innovation to improve public services, and unlock economic value to save time, to save money and to save lives.”

Kate Forbes MSP, Cabinet Secretary for Finance



Video

What is artificial intelligence?

The Royal Society (2:31)

Why is Scotland talking about AI?

AI techniques are usually driven by data, and lots of it. The data is used to ‘train’ the AI software to make inferences, decisions or recommendations. For example, Netflix uses the data from 130 million members, who watch 1 billion hours of movies a week, to train the AI to make a recommendation about what you will most want to watch next.

AI is part of everyday life already. You use it every time you search Google and it gives you exactly what you were looking for. Alexa uses it to turn you’re the word that you say to it into a weather report. Netflix uses it to predict what you’d like to watch based on your previous history.

It can be also used to create ever more disruptive technologies. It’s being used to make cars that don’t need drivers, or to pilot drones to deliver your online purchases, and soon your doctor could be using it to help assess your loved one’s symptoms more quickly and accurately, ensuring they get prompt access to the correct specialist treatment.

We’re talking about it now because it will increasingly have an impact on our lives.



About this pack



What is it?

In this pack you'll find learning materials about AI in Scotland. That includes writing, links to videos, links to further resources on topics such as facial recognition and autonomous vehicles. We encourage you to follow your interest.

Who is it for?

This pack is suitable for individual or group activities with any young person over 14 years old who is interested in how Artificial Intelligence will impact life in Scotland and some of the opportunities and challenges it presents for us as individuals and as a country.

Quizzes

You'll also find links to quizzes about a variety of topics about AI in Scotland. These quizzes test some of the knowledge but importantly they ask you what you think about some of the opportunities and challenges and what should happen with the future of AI in Scotland. Your opinions will then be combined with opinions of people from across Scotland to help shape the AI Strategy for Scotland.

How is it used?



There are different types of AI. These can be used in different applications from chatbots to autonomous vehicles.



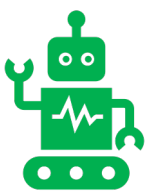
Visual perception

is the ability to identify objects, scenes, and activities in naturally occurring images. It's how Facebook sorts millions of users' photos, but it can also scan medical images for indications of disease and identify criminals from surveillance footage



Natural Language Processing

Is the difficult task of organising and understanding language in a human way. It's how Amazon Alexa turns sounds into concepts and answers.



Robotics

Is the creation and use of machines to perform physical tasks in unpredictable environments. They often use computer vision with sensors and other hardware. Examples include drones and care-bots.



Machine Learning

Is when computers discover patterns that exist in data and use them to learn how to perform a task that would normally require human intelligence. Machine learning could be involved when an email is flagged as spam, or a company warns you of a potentially fraudulent use of your credit card,.

The potential



Scotland has a history of innovating and has the potential to become a pioneer in the AI industry.



We're already trialling new applications of AI. The Scottish Mountain Rescue Team has used drones to find missing hikers, in 2020 driverless buses will be trialled on a route over the Forth road bridge and new drugs are being developed by AI in Dundee⁴. AI will have a big impact on Scotland beyond the use in your home or car.

What if ..

Scotland lead the way in making AI enabled technology?

It became a large part of our economic future with new businesses and high-income jobs?

AI in public services become more efficient and effective using AI?

Scottish companies use it to save money and enhance services?

What's the AI Strategy for Scotland?

The purpose of Scotland's AI Strategy will be to adopt AI to benefit Scotland's so that:

- the people of Scotland will flourish
- Scotland's organisations will thrive and prosper

How can we all benefit?

An effective AI strategy will contribute to our ambition to:

- create a more successful country
- give opportunities to all people living in Scotland
- increase the wellbeing of people living in Scotland
- create sustainable and inclusive growth
- reduce inequalities and give equal importance to economic, environmental and social progress



Go to Quiz > AI Basics

Take the quiz, share your voice, shape Scotland's AI Strategy

What are some of the applications of AI that will impact life in Scotland?

AI can be used in many technologies that impact on our lives. And the number of places its used is growing fast. The following gives an introduction to some of the ways that AI can be used, and some of the issues we need to consider.

1. **Healthcare**
2. **Public safety**
3. **Autonomous Vehicles**
4. **Facial recognition**
5. **Renewable energy**

Further reading



AI and Healthcare

Reading resources to give you a deeper level of detail on the topic.



Autonomous vehicles

Reading resources to give you a deeper level of detail on the topic.



Facial recognition

Reading resources to give you a deeper level of detail on the topic.

What are some of the biggest areas that we need to plan for?

AI will have a bigger impact than just the applications that we explore here. There are also areas that we need to consider to ensure that the people of Scotland benefit from all of the exciting benefits that AI can bring, and reduce any potential negative impacts of greater use of AI in Scotland.

1. **The changing landscape of work**
2. **Businesses in Scotland**
3. **Equality and bias in AI**
4. **Education**

Further reading



The changing landscape of work

Reading resources to give you a deeper level of detail on the topic.



Equality and bias in AI

Reading resources to give you a deeper level of detail on the topic.



Healthcare

Scotland's healthcare services could be revolutionised. Scotland has its own artificial intelligence health research centre to develop better patient diagnosis, treatment and outcomes.

Known as iCAIRD, it's where the NHS, universities and companies work together to develop new AI software like medical imaging for more rapid treatment for strokes, reading chest x-rays, and partly automated mammogram analysis for breast cancer screening.

We could all benefit from better healthcare but there are some challenges to using AI in Healthcare. Do people 'donate' their medical data to help create these technologies? Does the NHS keep the data so that that it's not exploited by private companies? Can I opt-out?



Go to Quiz > AI and Healthcare

Take the quiz, share your voice, shape Scotland's AI Strategy



Public safety

Drones can be AI enabled. Police Scotland has unveiled a new drone system to assist in searches for missing people. It's being used to search large areas in Scotland. With advanced computer vision technology it can locate a missing person from up to 150 metres away

Facial recognition is being used at events and in public spaces to identify people that the police are interested in.

New technologies used by the police force can raise questions of privacy. How will it be governed? Will it be possible to prevent drones from flying over your land? What if a drone causes an accident?



Autonomous vehicles

Vehicles that can navigate without a driver are AI enabled. They have the potential to bring transformative change to peoples' lives "not just in how we travel, but in how we work, where we live, the environment, and safety."

One of its first projects is a fleet of autonomous buses running from Fife and Edinburgh, via the Forth Road Bridge. A consortium with government, industry and academia working on the design, development and operation of the full-sized fleet.



Go to Quiz > Autonomous Vehicles

Take the quiz, share your voice, shape Scotland's AI Strategy



Facial recognition

From unlocking your smart phone to tracking suspected criminals, facial recognition is becoming more common in our daily lives. We don't know how widespread its use is in the UK

but research has shown that companies such as Ladbrokes, shopping centres, conference centres and museums have used it. The MET Police have announced they will roll out its use across London.



Go to Quiz > Facial recognition

Take the quiz, share your voice, shape Scotland's AI Strategy

Renewable energy

Scotland has ambitious emissions targets which makes new technologies important in becoming carbon neutral. AI is being used to develop more efficient food supply chains and to map waste and resources to identify recycling opportunities for waste and by-products.

Renewable energy can be more reliably managed with the aid of AI to predict the weather, when solar and wind powered energy will be produced, and to distribute the energy to the right place at the right time now and into the future.





The changing landscape of work

If we make the most of AI it will have a big impact on work. Some jobs might change a little, some dramatically, and some will be displaced altogether over time. We'll need specialists to design and deploy the technology and all need new skills to make the most of it.

Industry networks and unions are calling for a partnership approach to technological change in the workplace that involves

consultation between employers, workers and other stakeholders to make sure that we continue to innovate, that employees and people new to the workplace are offered the chance to learn the skills for the new jobs emerging, and that the benefits of using AI in the workplace are shared.



[Go to Quiz > Future of work](#)

Take the quiz, share your voice, shape Scotland's AI Strategy



Businesses in Scotland

Automation can make a positive impact on productivity in businesses. Examples include automating expense claims and data entry to making chat bots and speech recognition for customer service. Manufacturing and delivery of goods will also become increasingly automated.

There is almost no industry that won't be effected. Some will be completely disrupted – for instance delivery drones will likely replace delivery drivers.





Equality and Bias in AI

Human biases are well-documented. There is solid evidence that humans are biased, even if we're not aware of it. Over the past few years, society has started to wrestle with just how much these human biases can make their way into artificial intelligence systems – with harmful results. At a time when companies and the public sector are looking to deploy AI systems across their,

Operations, being aware of those risks and working to reduce them is an urgent priority.

Bias can creep into algorithms in several ways. AI systems learn to make decisions based on data, which can include biased human decisions or reflect historical or social inequities, even if sensitive variables such as gender, race, or sexual orientation are removed.



Go to Quiz > Equality and bias in AI

Take the quiz, share your voice, shape Scotland's AI Strategy



Education

Technology is an important part of Scotland's economic future. A new generation is needed to train and take up jobs in the tech sector.

That means more for data and computer scientists and also creatives and designers, project managers, and new awareness and skills in equality and ethics to make the tech products.

Despite its huge potential AI education is under-developed. There are calls for greater diversity in tech to shape it to reduce the potential for bias and to be as effective as it can be.

What does the future of AI in Scotland look like?



“

My vision is about how we prepare NHS Scotland to be able to engage with .. artificial intelligence and to fit it into service with clinicians and patients to improve the quality of healthcare that we deliver”

- Dr David Lowe

”

“

A lot of other countries are in a technology race but Scotland is uniquely positioned to think about the right way to do it and to make sure it aligns to Scotland's values. I think it will give us the best results.

- Alessandra Fassio

”

“

(Scotland can) take a global lead in developing safe, innovative and ethical data strategy.

- Scottish Council for Development and Industry

”

“ *For me it would look like a progressive economy, a flourishing labour market but most importantly it would be innovation embedded in equality where everybody gets a chance to participate...it's not innovation for innovations sake...it would be AI for social good.* ”

- Talat Yaqoob

AI in Scotland

What's your vision for AI in Scotland

Thinking about what you've learned in this pack about life in Scotland with AI. Write a description of your vision for AI in Scotland.

What action should we take to reach this vision for AI in Scotland?

Thinking about some of the challenges, what actions would like us to take in Scotland to ensure that we all thrive in a Scotland with AI.



Upload your vision >

Upload a copy of your vision for AI in Scotland and shape Scotland's AI Strategy