What is machine learning?

Many services that we use every day rely on machine learning - a field of science and a powerful technology that allows machines to learn from data and self-improve.

Future developments could support the UK economy and will have a significant impact on society.

Machine learning

Machine learning is used in internet search engines, email filters to sort out spam, websites to make personalised recommendations, banking software to detect unusual transactions, and lots of apps on our phones such as voice recognition.

The technology has many more potential applications, some with higher stakes than others. Future developments could support the UK economy and will have a significant impact upon society. For example, machine learning could provide us with readily available 'personal assistants' to help manage our lives, it could dramatically improve the transport system through the use of autonomous vehicles; and the healthcare system, by improving disease diagnoses or personalising treatment. Machine learning could also be used for security applications, such as analysing email communications or internet usage. The implications of these and other applications of the technology need to be considered now and action taken to ensure uses will be beneficial to society.

Machine learning is distinct from, but overlaps with, some aspects of robotics (robots are an example of the hardware that can use machine learning algorithms, for instance to make robots autonomous) and artificial intelligence (AI) (a concept that doesn't have an agreed definition; however machine learning is a way of achieving a degree of AI).

What is the Royal Society project about?

There are both opportunities and challenges around this transformative technology

There are both opportunities and challenges around this transformative technology and it raises social, legal, and ethical questions. This is why the Royal Society is starting a project on machine learning, aiming to stimulate a debate, to increase awareness and demonstrate the potential of machine learning and highlight the opportunities and challenges it presents. In the course of the project we will engage with policymakers, academia, industry and the wider public.

The project will focus on current and near-term (5-10 years) applications of machine learning. It will have a strong public engagement element, and a variety of resources will be produced over the course of the project. Details of these will also be posted these web pages.

The project scope was developed by a Core Group of experts who met over the summer 2015.

Who will inform this project?

This Royal Society project is led by a Working Group involving a range of expertise.

Answers to our call for evidence (now closed) also inform the project.

Evidence gathering sessions and public events will be held over the course of the project.

What will come out of the project?

The project also pulls together evidence-based recommendations in a policy report for UK and EU policy makers, published April 2017.

What is machine learning?

These videos, visualisations and podcasts explain different aspects of machine learning more fully:

Machine learning interactive infographic

An interactive infographic that lets you test yourself against machine learning and share your results.

Explore the infographic

Machine Learning and Deep Neural Networks Explained

A video, generated by industry, providing a concise and simple introduction to deep learning, a method of machine learning.

Watch the video

Machine Learning Q&A

Mathematician Professor Marcus Du Sautoy answers your social media questions on machine learning.

Watch the video

Machine Learning Conference

Videos from The Royal Society ‘Transforming our futures’ conference on machine learning in May 2015.

Watch the videos

Talking Machines

TALKING MACHINES

HUMAN CONVERSATION ABOUT MACHINE LEARNING

Talking Machines, a podcast covering current research and applications of machine learning, featuring world-class machine learning scientists.

Listen to the podcast

Conversation Between Robots - The Hunt for AI

A video showing how robots can use machine learning to develop a language.

Watch the video

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