



Conversations on... Artificial Intelligence

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Conversations on...AI: Upcoming sessions



- Conversations on... is a series of facilitated sessions to bring together academics and researchers from across the University with an interest in a chosen topic.
- **Conversations on Healthy Ageing**
 - 12th September 12-2pm, Rowett Institute conference room, ground floor.
- **Coming soon:**
 - Conversations on Water Security/Sustainability: 31st October 2018
 - Conversations on Oil and Gas Decommissioning & Late Life: November 2018
 - Conversations on Marine (Life below the water): Autumn 2018
 - Conversations on Quality Education: Autumn 2018
 - Conversations on Sustainable Cities and Communities: Autumn 2018

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- A comprehensive programme of development to enhance our research environment.
- Supports all stages of the research life cycle: conception of ideas, through development and refinement of an application, to research delivery and realising impact.
- Offers the ability to be better prepared for opportunities and **enhance our ability to respond to calls**.
- Relevant to today, supports:
 - Effective horizon scanning
 - Facilitation of early ideas development
 - Supporting interdisciplinary working

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Conversations on...AI: Aims and outcomes

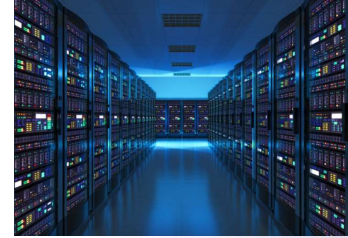


- Showcase the breadth of expertise, ongoing and future research, research interests, and 'who does what' within AI
- Opportunity to further explore that research
- Discuss AI topics from your own expertise and research perspective
- Consider how your expertise might align across disciplines with a view to continuing discussions and possible future cross-discipline or cross-School collaborations
- Discuss direction of AI research and where future focus might lead
- Continue conversations beyond this session

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Conversations on...AI: Format

- Introduction
 - Session format, AI context, research drivers, direction of AI research
- Research Sharing
 - Snapshot of 'who does what'
 - Quick overview of AI research, expertise, and areas of interest
- Conversations
 - Opportunity to discuss pertinent themes from your own research perspective
 - Discover AI research in other disciplines
- Feedback

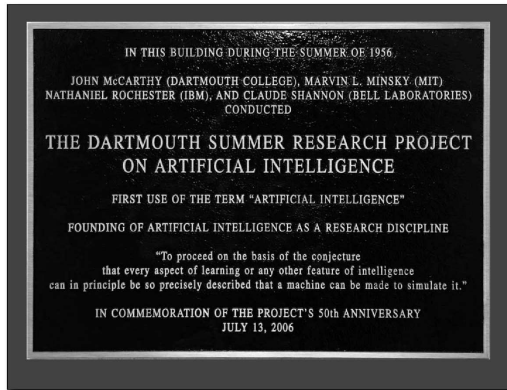


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Prof Pete Edwards
Computing Science, NCS

Not the First Conversation on AI ...



*"We propose that a two-month, 10-man st **artificial intelligence** be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire.*

The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.

An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves.

We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer".

John McCarthy, Marvin Minsky, Nathaniel Rochester and Claude Shannon, A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence, 31 August 1955.

Artificial Intelligence: A Definition ...

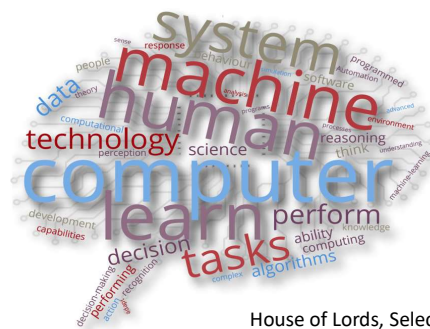


- No widely accepted definition of *artificial intelligence* ...

"Technologies with the ability to perform tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and language translation."



AI systems today usually have the capacity to learn or adapt to new experiences or stimuli.



House of Lords, Select Committee on Artificial Intelligence Report, April 2018.

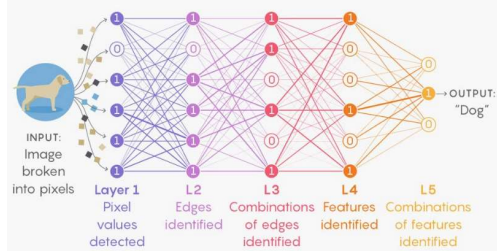
Machine Learning vs AI

- The terms 'machine learning' and 'artificial intelligence' are sometimes conflated or confused.
- Machine learning is in fact a particular type of artificial intelligence which is especially dominant within the field today.
 - e.g. *Deep neural networks*



Learning From Experience

Deep neural networks learn by adjusting the strengths of their connections to better convey input signals through multiple layers to neurons associated with the right general concepts.



When data is fed into a network, each artificial neuron that fires (labeled "1") transmits signals to certain neurons in the next layer, which are likely to fire if multiple signals are received. The process filters out noise and retains only the most relevant features.

Real-World Applications



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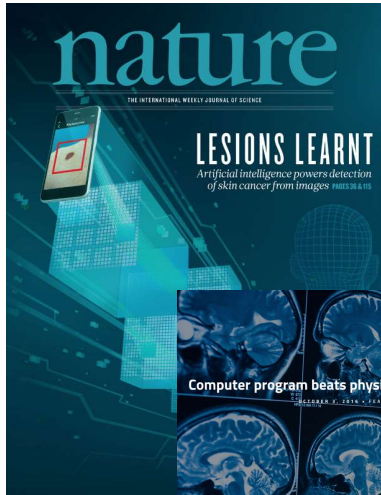


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Potential & Challenges ...



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SUPERVISION AND COMPLIANCE MONITORING

Compliance monitoring is a key component of any effective enforcement program whether criminal, professional, good-conduct, or through your treatment docket team. Case plans based on the risks presented by an individual as well as their criminogenic needs help to ensure the best outcomes for participants and for your programs, too.

COURTS ARE USING AI TO SENTENCE CRIMINALS. THAT MUST STOP NOW

Uber
Uber's self-driving car saw the pedestrian but didn't swerve - report

Tuning of car's software to avoid false positives blamed, as US National Transportation Safety Board investigation continues

AI & Machine Learning - Policy Landscape



House of Commons Science and Technology Committee
Robotics and artificial intelligence
Fifth Report of Session 2016-17

Machine learning:
the power and promise of computers that learn by example

THE ROYAL SOCIETY

GROWING THE ARTIFICIAL INTELLIGENCE INDUSTRY IN THE UK
Professor Dame Wendy Hall and Jerôme Pesenti

HOUSE OF LORDS
Select Committee on Artificial Intelligence
Report of Session 2017-19
**AI in the UK:
ready, willing and able?**

Industrial Strategy
Building a Britain fit for the future

186
UK Government

Growing the AI & Data-Driven Economy

We will put the UK at the forefront of the AI and data revolution.

Technological Change and the Scottish Labour Market

APRIL 2018

Scottish Government

UK Funding Landscape


£0.95 Bn

Policy paper
AI Sector Deal
 Published 26 April 2018

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Next generation services
 An overview of government's challenge to industry and research to help the British industry take advantage of new technologies.

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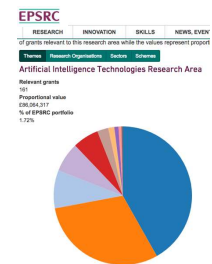
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Up to £50 million for new Centres of Excellence to deliver 21st Century healthcare - call open



House of Lords Select Committee on AI

- What are the potential opportunities presented by artificial intelligence? How can these be realised?
- How does AI affect people in their everyday lives, and how is this likely to change?
- What are the possible risks and implications of artificial intelligence? How can these be avoided?
- How should the public be engaged with in a responsible manner about AI?
- What are the ethical issues presented by the development and use of artificial intelligence?

Conversation Themes



- Realising & Deploying AI
 - Machine learning, natural language processing, (semi)automated reasoning.
- Mitigating the Risks of AI
 - Legal liability, future regulation, misuse of AI.
- Intelligible AI
 - Transparency, explainability, avoiding bias.
- Living & Working with AI
 - Education, impact on social & political cohesion, employment.