

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

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*The impact on society of machine learning:  
an opportunity or a threat?*

Foundation for Science and Technology  
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### The Royal Society's machine learning project

expertise and  
engagement

Digital interactions:

**60,000**

Face-to-face encounters:

**15,000**

Wider contributions:

**1,500**

Practitioner participation:

**500**

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**The Royal Society's machine learning project**

five areas for action

Data



Skills



Business



Society



Research



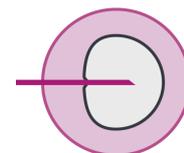
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**Government Chief Scientific Advisor's report 2014**

Innovation: managing risk, not avoiding it

Questions people ask

- Who benefits, and who carries the risks?
- Who pays? Is it fair?
- What are the other options and pathways?
- What values are at stake?
- Who is in control?
- What might be the unanticipated consequences?
- Who or what can I trust?



.... With context-specific answers

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**Machine learning and society**

participants' initial orientations

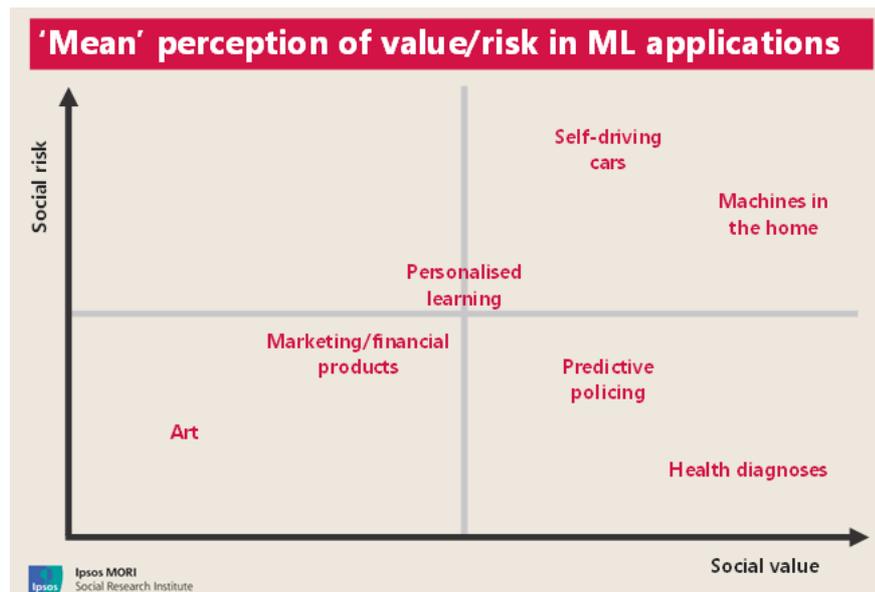
- “I can personally relate to this technology because I can see where this could have an impact on my life whether good or bad”
- “This is an important emerging technology and it carries potential risks and benefits to society”
- “I’m suspicious about the purpose of this technology”
- “I can’t see how this would work – humans are too unique for machines to really understand us”



Work by Ipsos Mori for the Royal Society report on Machine Learning: the Power and Promise of Computers that Learn by Example

**Machine learning and society**

context is key in public views of machine learning



### Machine learning and society

report recommendations

- Governance surrounding the use of data requires a new framework to keep pace with the challenges in the 21st century.
- It is not appropriate to set up governance structures for machine learning per se. Specific questions about the use of machine learning in specific circumstances should be handled in a sector-specific way.



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Royal Society report on Machine Learning: the Power and Promise of Computers that Learn by Example

### Data management and use

disconnected debates



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**Governance in the 21<sup>st</sup> century**

report recommendations

A new guiding principle:  
**promote human flourishing**



With a stewardship body to:

- Ensure delivery of critical functions
- Catalyse and act

Expert, deliberative, anticipatory

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British Academy and Royal Society report: Data management and use: Governance in the 21<sup>st</sup> century

**Machine learning**

a new wave of research

- Interpretability
- Verification and validation
- Privacy
- Dealing with real-world data
- Causality
- Human-machine interaction
- Security



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**END**