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GIRO50 Conference 2023

1–3 November, EICC Edinburgh

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With great power comes great responsibility: professionalism and ethics for actuaries in data science

Hazel Davis and Murray Lidgitt

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Classification: Public

Image Source: Google CEO Sundar Pichai says impact of AI is 'profound' | Daily Mail Online

"AI is one of the most important things humanity is working on. It is more profound than, I dunno, electricity or fire"

Sundar Pichai – CEO of Google, January 2018

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Classification: Public

About us

Hazel “Barbie” Davis, FIA

Murray “Ken” Lidgitt, FIA

Source: www.fotor.com

Classification: Public

Agenda

- Regulation
  - Data and discrimination
- Professionalism
  - Fairness and integrity
- Ethics
  - Where to draw the line

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Do you currently use machine learning or AI techniques or outputs in your day-to-day work?

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How sophisticated is your company's use of machine learning or AI?

ⓘ Start presenting to display the poll results on this slide.

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Regulation

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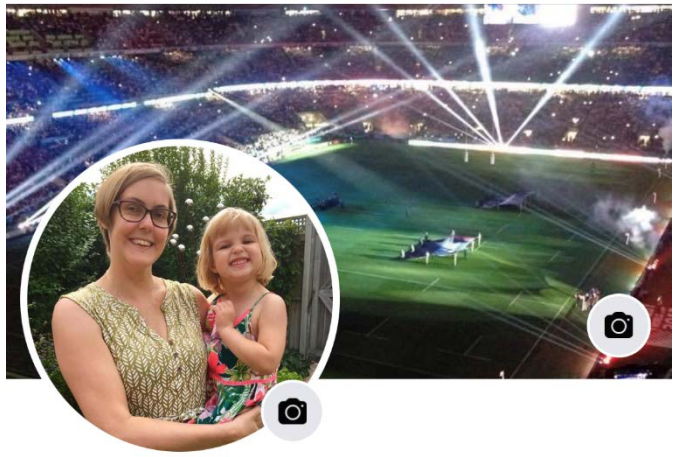
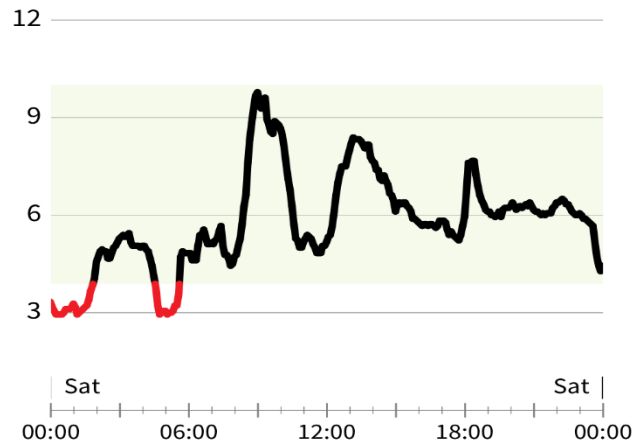
Could actuaries be responsible for the next big data privacy scandal?

- New data?
- New analysis?
- GDPR rules apply!
- Make friends with your data protection team





Hazel Davis

255 friends

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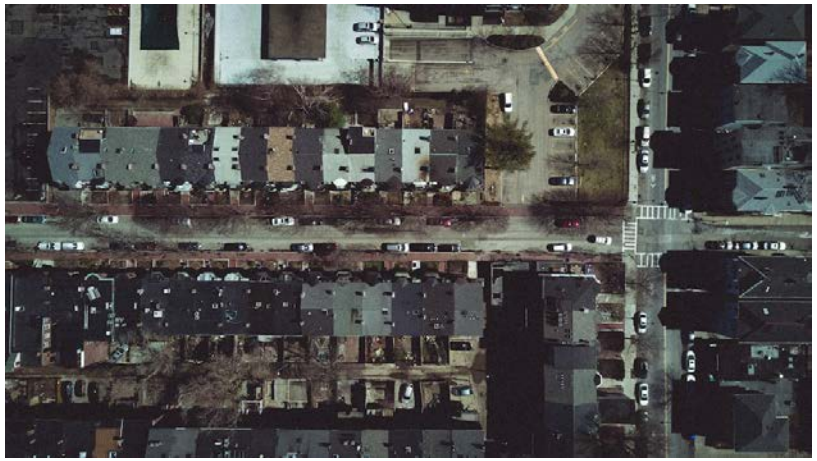
Can you? Should you?

- In 2016 Admiral cancelled plans to launch a product that priced on Facebook data
- US customers unhappy with insurers using aerial photography to risk assess homes
- Consider the public reaction
- Does greater use of data benefit society?



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Avoiding discrimination

- Are minority groups represented?
- Are factors and correlations with protected characteristics understood?
- Is systemic discrimination impacting data?
- Are training outcomes biased?
- Knowledge of protected characteristics enables checking

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Apple card sparked fair lending investigation

- High profile tweets suggested a gender bias
- Legal investigation cleared apple
- Test only checked for direct discrimination, not proxy discrimination.
- Law hasn't kept up with technology

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BBC News - Apple's 'sexist' credit card investigated by US regulator - BBC News
https://techcrunch.com/2021/08/14/how-the-law-got-it-wrong-with-apple-card/
Photo by blocks on Unsplash

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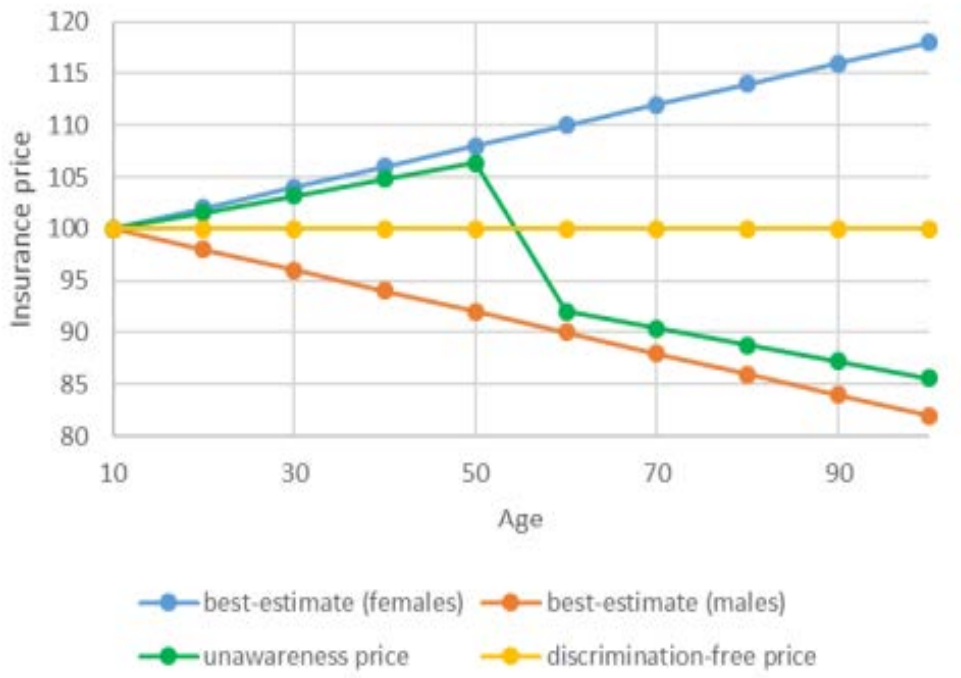
Professionalism

Classification: Public

Beyond the letter of the law - discrimination free pricing

- Unawareness price from model without gender displays indirect discrimination
- Gender effect comes through age proxy (data <50 is mainly female, >60 is mainly male)
- Build a male and a female model, then combine
- Straightforward when gender is known, but gender model could be used to fill in gaps



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Classification: Public

Mitigating unwanted bias - adversarial models

- First model predicts the variable of interest Y from input data X
- Adversary model predicts the protected characteristic Z, from the first model output Y
- Choose a model to maximise the prediction of Y subject to minimising the ability of the adversary to predict Z

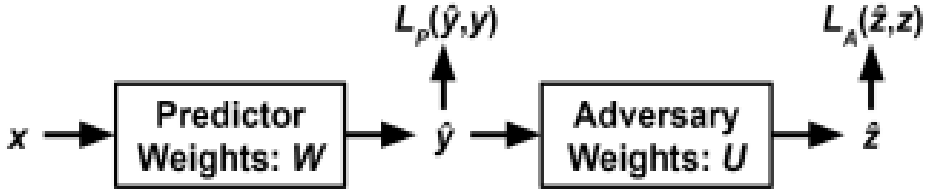

Figure 1: The architecture of the adversarial network.

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A fair pricing model vis adversarial learning. Srxiv-vanity.com/papers/2202.12008
Mitigating Unwanted Biases with Adversarial Learning, https://dl.acm.org/

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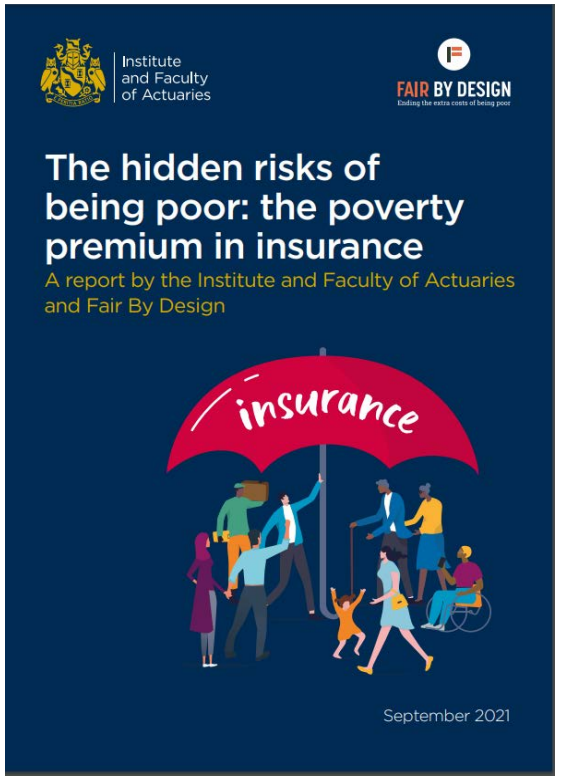
Legal discrimination – the poverty premium

- ‘The average household in poverty pays almost £500 a year extra for essential services such as credit, energy and insurance…’
- ‘…Vulnerable and low-income consumers can present a higher risk to insurers, due to a range of factors often outside the consumers’ control’
- Increasingly personal pricing can lead the more vulnerable in society without cover
- Is it fair? How do you define fair?



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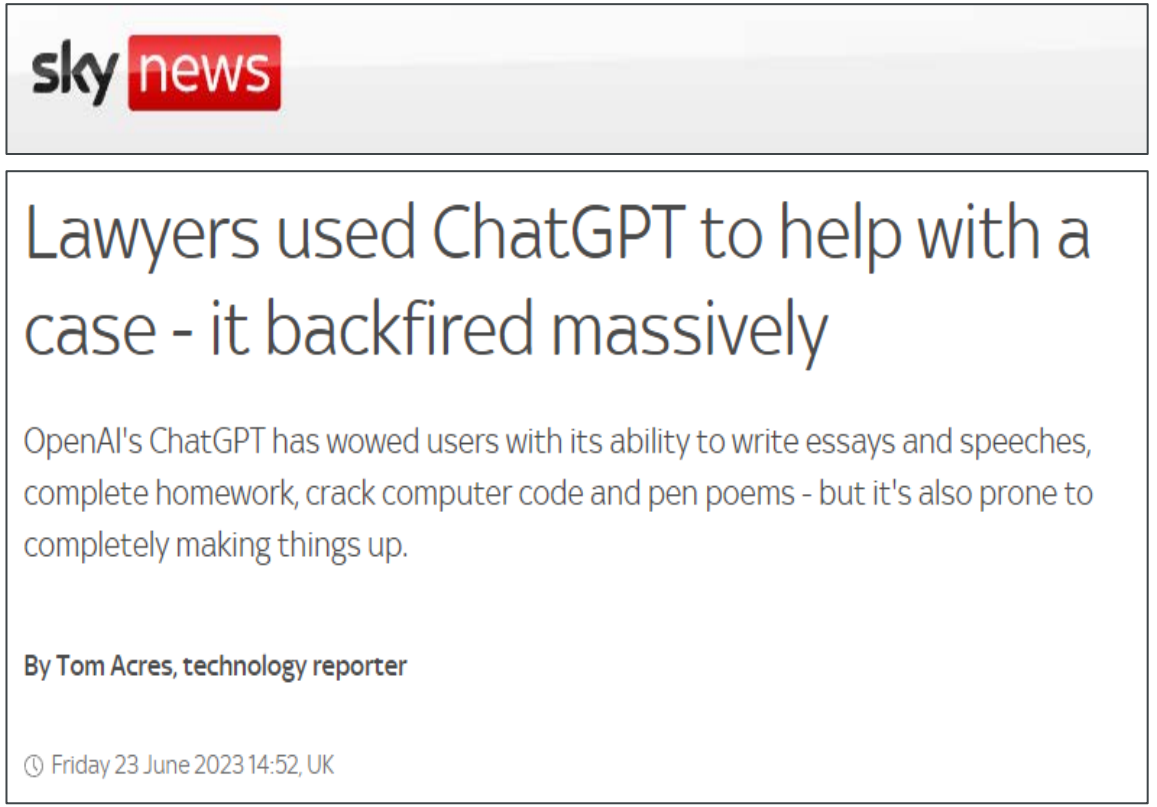
Taking responsibility

- Understand limits of generative AI
- Double check everything (material)
- Plagiarism risk
- Transparency



sky news

Lawyers used ChatGPT to help with a case - it backfired massively

OpenAI's ChatGPT has wowed users with its ability to write essays and speeches, complete homework, crack computer code and pen poems - but it's also prone to completely making things up.

By Tom Acres, technology reporter

Friday 23 June 2023 14:52, UK

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Sky News https://news.sky.com/story/lawyers-fined-after-citing-bogus-cases-from-chatgpt-research-12908318

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Ethics

In the spotlight

Facial recognition could transform policing in same way as DNA, says Met chief

Sir Mark Rowley says technology could help catch wanted criminals, but rights campaigners warn of privacy violations

Sir Mark Rowley, the Met police commissioner, told the thinktank Policy Exchange that facial recognition technology surpassed his expectations. Photograph: Tayfun Salci/Zuma Press Wire/Shutterstock

Britain's most senior police officer has predicted that facial recognition technology will transform criminal investigations as much as DNA testing has done, a prospect described as dystopian byhuman rights campaigners .

'Self-driving' cars to be allowed on UK roads this year

28 April 2021 · Comments

Drivers will be allowed to take their hands off the wheel if ALKS is enabled

By Cristina Criddle
Technology reporter

"Self-driving" vehicles could be allowed on UK roads by the end of this year, the government has said.

nature

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COMMENT | 21 February 2023

AI weapons: Russia's war in Ukraine shows why the world must enact a ban

Conflict pressures are pushing the world closer to autonomous weapons that can kill without human control. Researchers and the international community must join forces to prohibit them.

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Sources:
The Guardian - Facial recognition could transform policing in same way as DNA, says Met chief | Police | The Guardian
Nature - AI weapons: Russia's war in Ukraine shows why the world must enact a ban (nature.com)
BBC news - 'Self-driving' cars to be allowed on UK roads this year - BBC News

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Autonomous cars and the “Moral Machine”

90%+

Fatality reduction

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Source:

1) Wall Street Journal - Self-Driving Cars Could Cut 90% of Accidents – WSJ
2) Moral Machine

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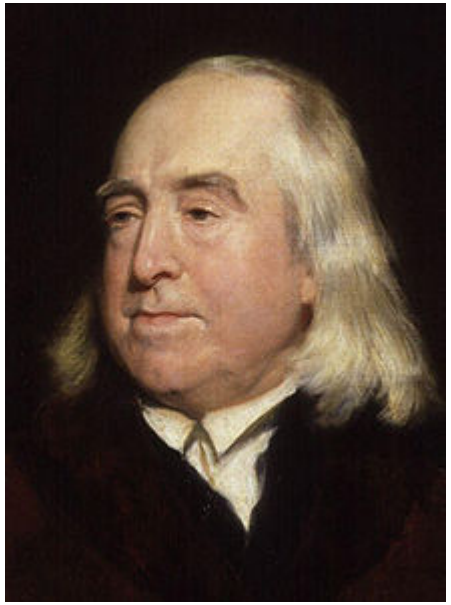
(Some) Ethical frameworks

Jeremy Bentham
“Utilitarianism”



Immanuel Kant
“Categorical imperative”

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Sources:
1) https://upload.wikimedia.org/wikipedia/commons/thumb/c/c8/Jeremy_Bentham_by_Henry_William_Pickersgill_detail.jpg/440px-Jeremy_Bentham_by_Henry_William_Pickersgill_detail.jpg
2) https://upload.wikimedia.org/wikipedia/commons/thumb/f/f2/Kant_gemaelde_3.jpg/440px-Kant_gemaelde_3.jpg

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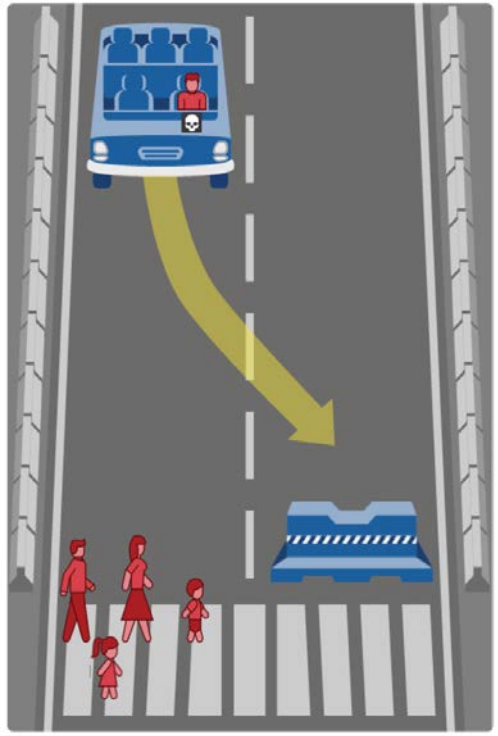
Basic principles



Bentham

Kant

Source: Moral Machine

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Which scenario would you support?

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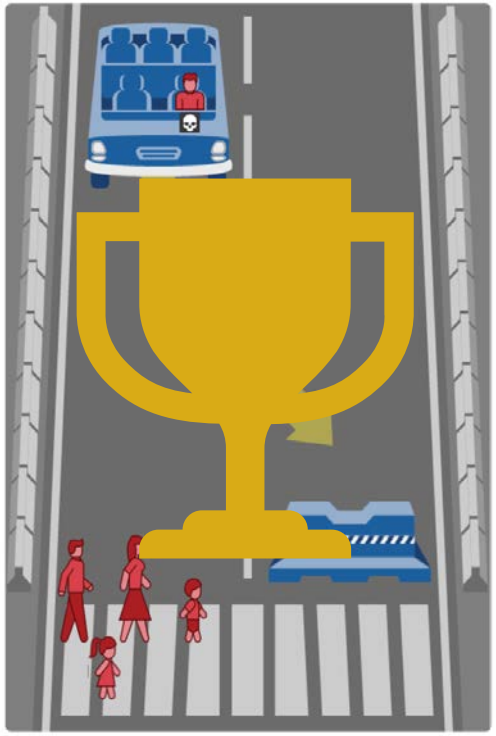
Bentham vs Kant



Bentham

Kant

Source: Moral Machine

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Would you buy an autonomous car that would kill you, the driver, in such a collision?

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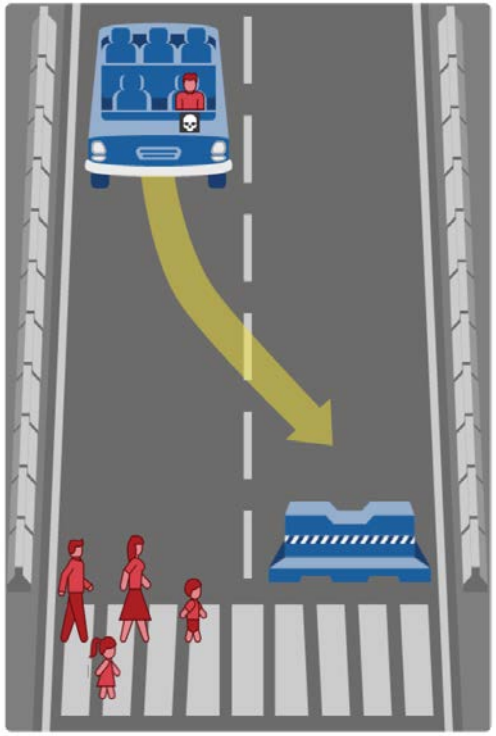
Classification: Public

Bentham vs Kant



Bentham

Kant

Source: Moral Machine

Classification: Public

Social dilemmas

A Social dilemma exists whereby:

1) An individual benefits by exercising self-interest

2) If everyone chooses self-interest, then everyone ends up worse off

Robyn Dawes, 1980

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Examples

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Source – Planet - Photo by Unknown Author is licensed under CC BY-SA
Source – Sprinklers - This Photo by Unknown Author is licensed under CC BY-NC-ND

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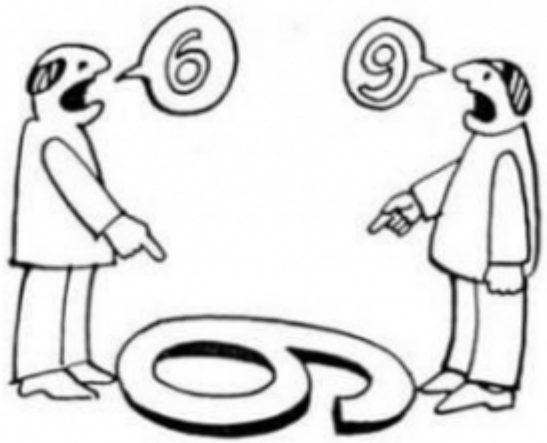
So what's the solution?

- Regulation

…Problematic

  - Opt-outs / workarounds
  - Lack of domestic consensus
  - Lack of international consensus



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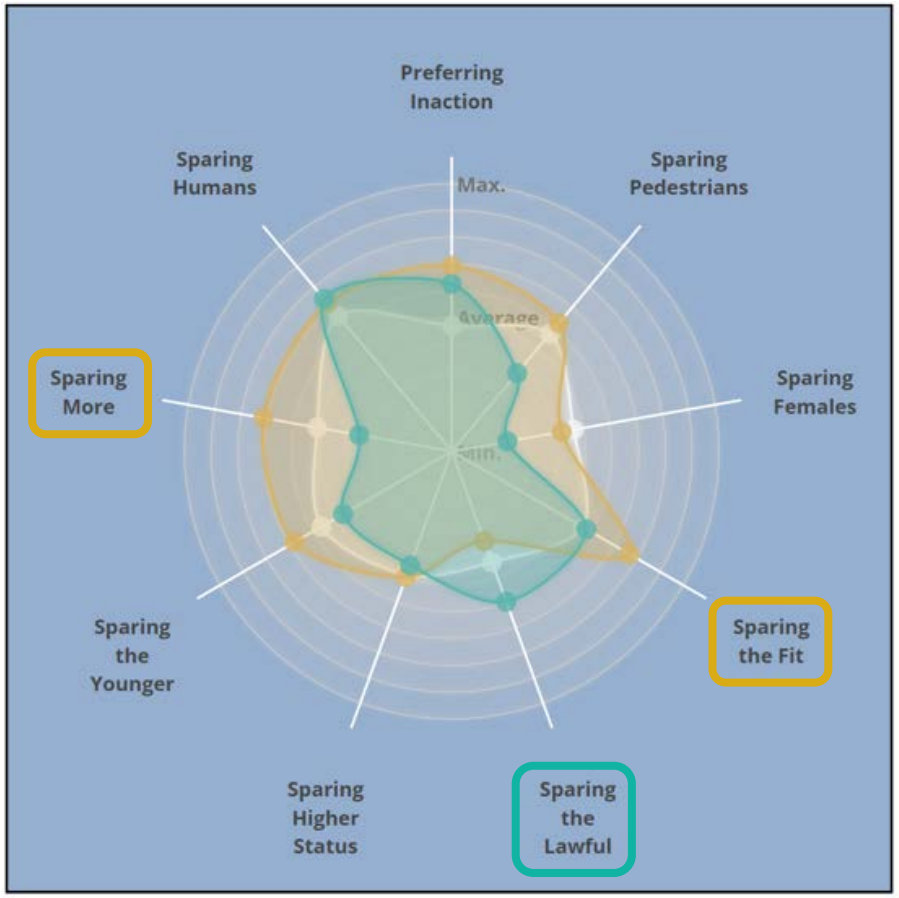
Different attitudes to ethics – UK vs Russia



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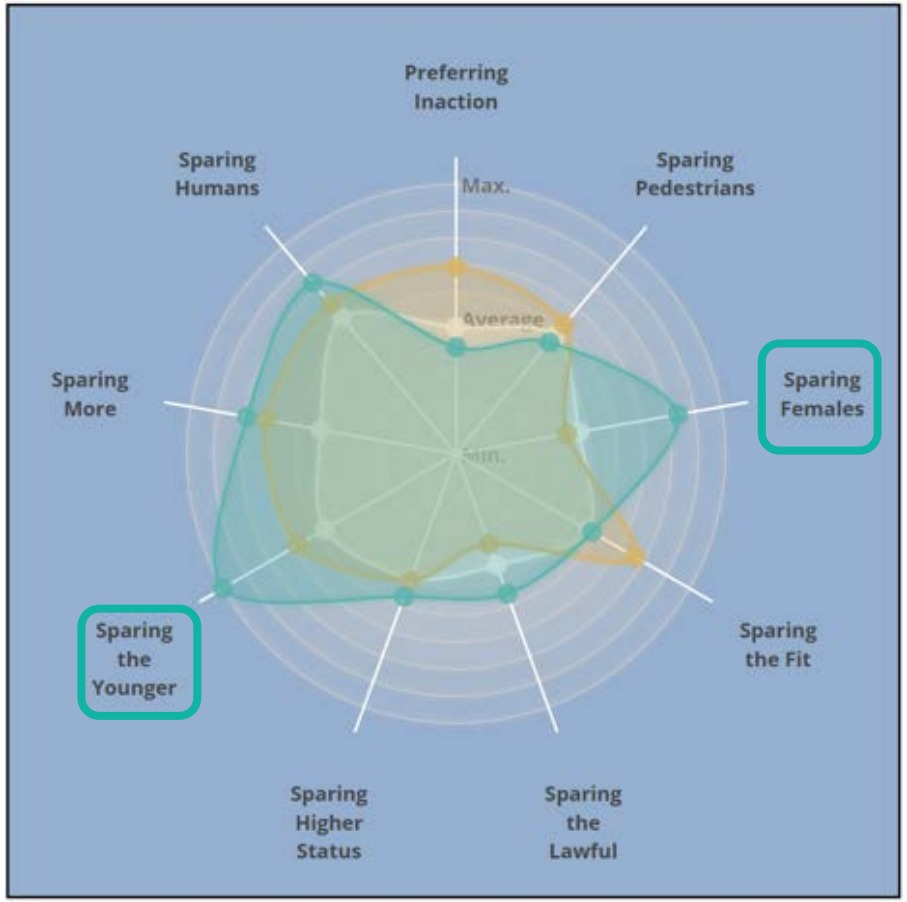
Source: Moral Machine

Classification: Public

Different attitudes to ethics – UK vs France



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Source: Moral Machine

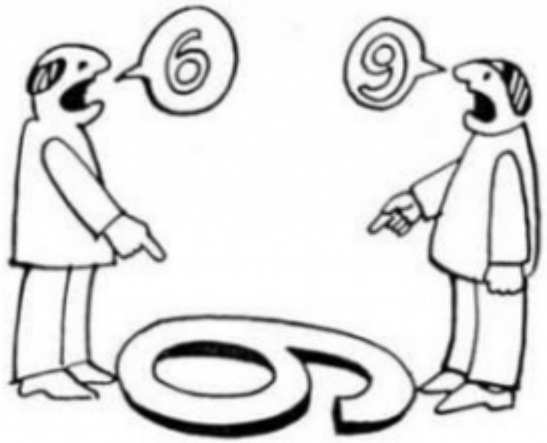
Classification: Public

So what's the solution?

- Regulation

Problematic

- Opt-outs
- Lack of domestic consensus
- Lack of international consensus
- Changes in attitudes over time



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What does this mean for Actuaries?

Enhancing regulatory oversight

Enhancing professional oversight

Emerging risk registers

Data sourcing

Data in the public domain
vs
Public data

Existential threat to insurance industry

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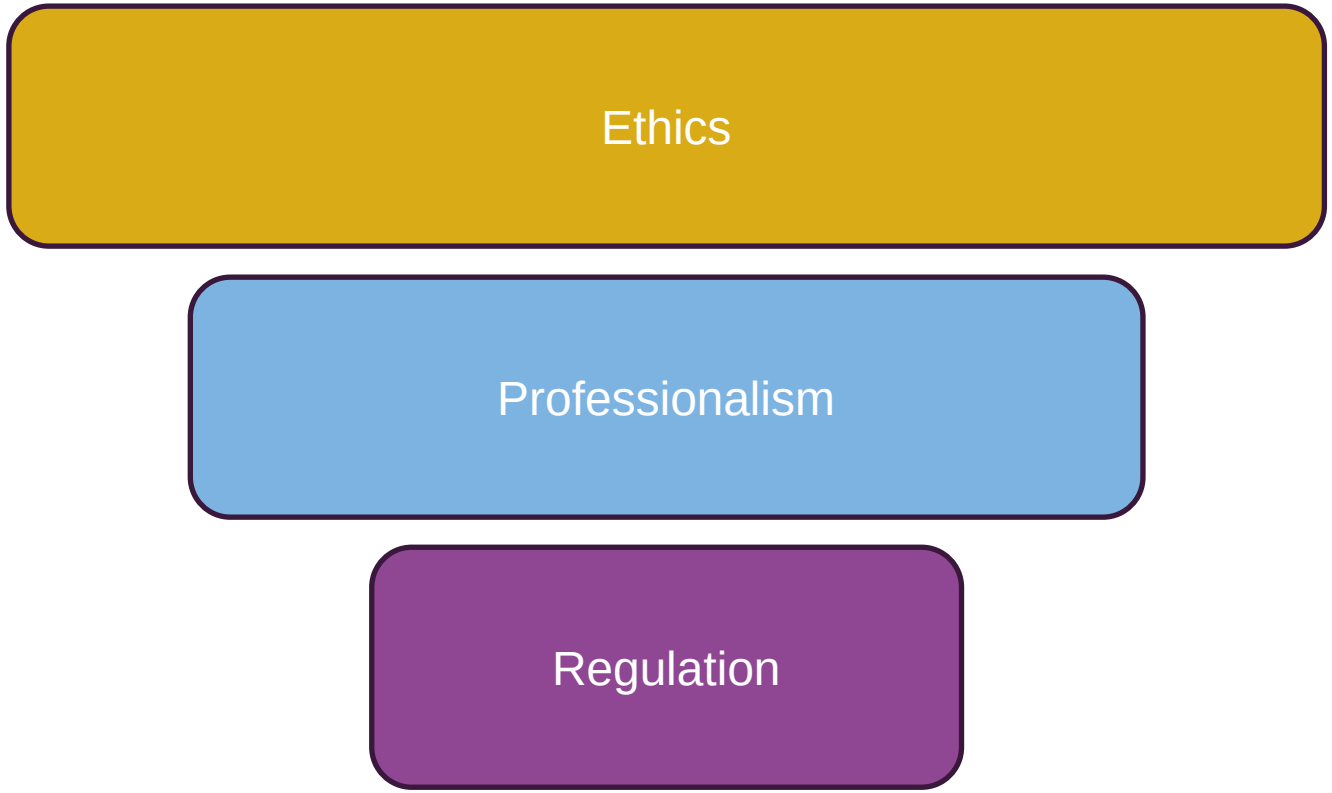
Final thoughts



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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter. This presentation is for information only and does not constitute advice.

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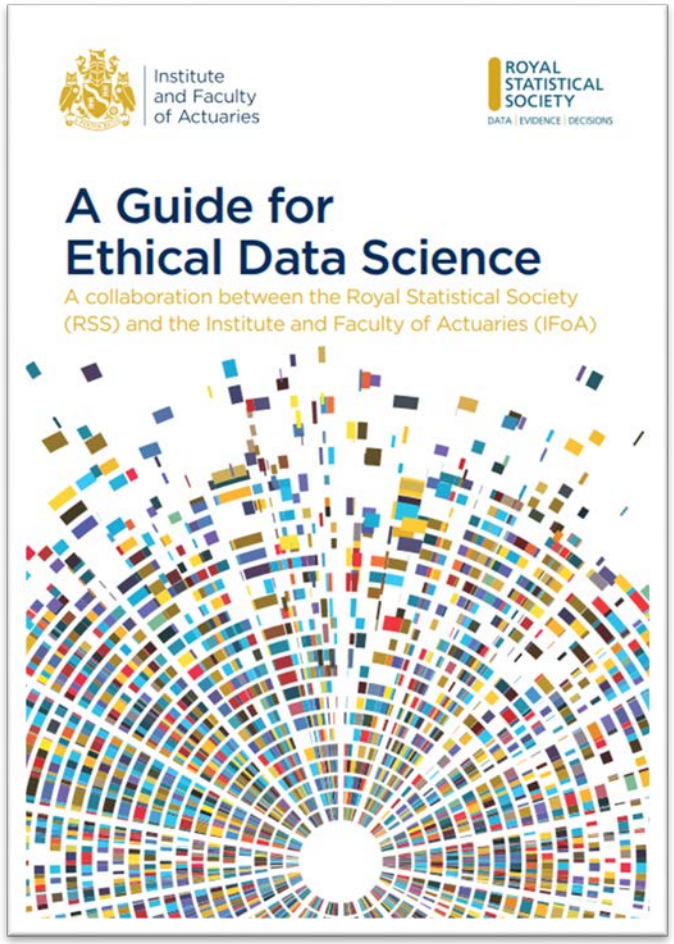
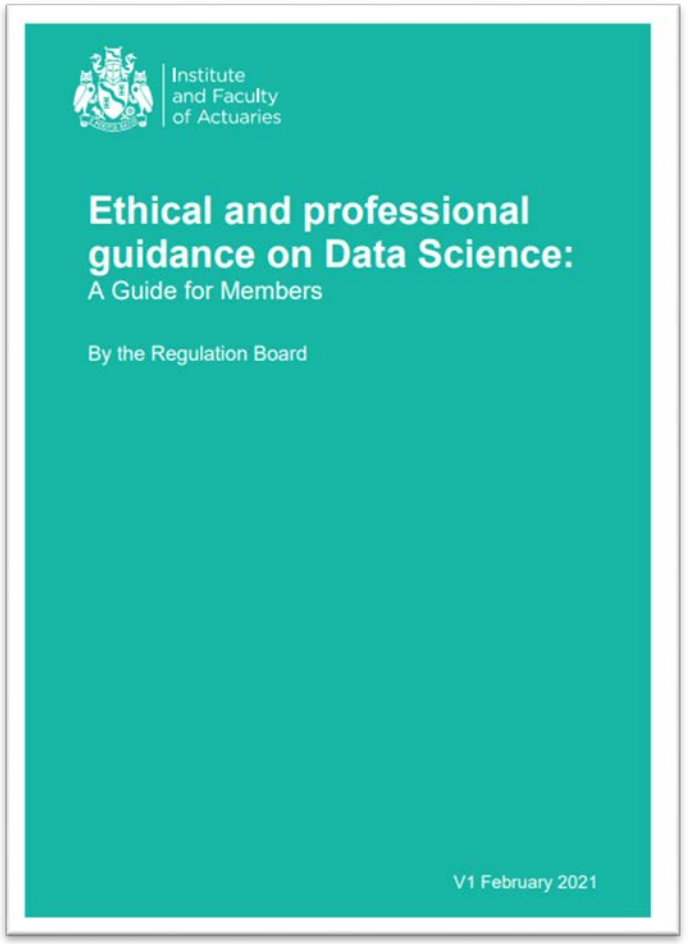
Where can I find more guidance?





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Thank you