Ethical Dilemmas in AI and Financial Services

First HSBC-GCD Conference for Credit and Financial Risk in Krakow

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SVP at HSBC in Kraków

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Dr. Philippe De Brouwer

- Academic
  - Theoretical physicist and Business Engineer; solved the “fallacy of large numbers” puzzle (Samuelson).
  - Challenged Markowitz’s Mean Variance Theory, developed Maslowian Portfolio Theory.
- Career
  - Fortis/BNP (capital-guaranteed funds, director),
  - KBC (merged companies, CEO, market growth).
  - CIO of KBC Ireland (€32B, 1000 funds).
  - Head of Analytics RBS (financial risk, analytics, data)
  - SVP at HSBC (Model Risk Management CoE).
- Author: “The Big R-Book” and numerous scientific papers.

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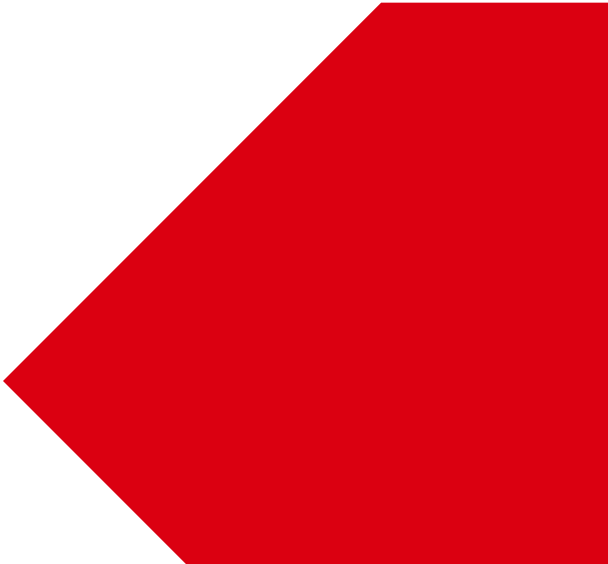
Defining Ethics



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A Formal Definition – Cambridge Dictionary

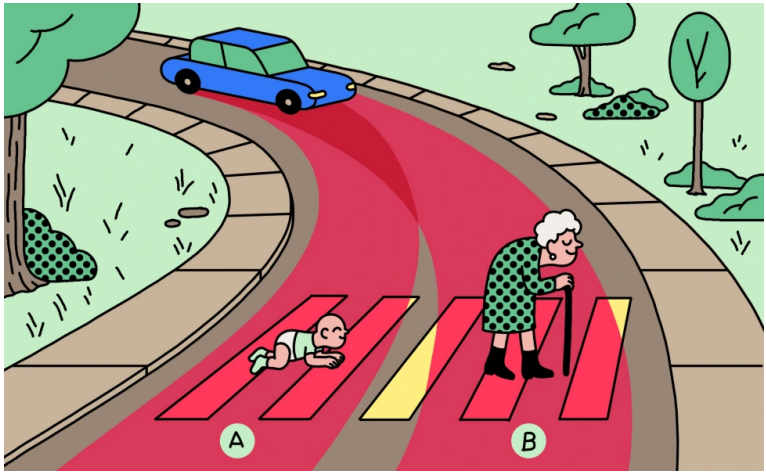
Ethics

the study of what is morally right and wrong, or a set of beliefs about what is morally right and wrong.

Does it need to be difficult?

Figure: Two mokeys are paid an unequal reward - Frans De Waal / TED — Brosnan and De Waal, 2003

Dilemma 1: Kill the Baby or Old Person?



(A) steer right and kill the baby
(B) steer left and kill the old person

More Car Dilemmas (I)

Imagine the car cannot stop in time. Should the autopilot of the car

(A) turn right and kill the person on the pavement

(B) continue straight and kill the people that are on the street (where they should not be)

More Car Dilemmas (II)

Imagine the car cannot stop in time. Should the autopilot of the car

(A) turn right and kill the driver

(B) kill the person on the street

More Car Dilemmas (III)

Imagine the car cannot stop in time. Should the autopilot of the car

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Is it ethical to remove a tree that houses a squirrel to build your house?

(A) it is ethically acceptable to remove the tree
(B) it is *not* ethically acceptable to remove the tree

Is it ethically acceptable for an alien society to invade earth?

Imagine a society that is billions of years more advanced than us. They want to make earth their home. Is that ethically acceptable for you?

(A) yes (I will happily die to make place for them)

(B) no (I will resist all I can)

What is ethically acceptable depends on your viewpoint

Figure: Ethics is complex and it depends on your point of reference and you frame.

Artificial Intelligence

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A Definition of AI

Artificial Intelligence

A cross-disciplinary approach to understanding, modelling, and replicating intelligence and cognitive processes by invoking various computational, mathematical, logical, mechanical, and even biological principles and devices. —Brundage, 2015

or

AI in Britannica.com

the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings

or

AI in Wikipedia

First Some Simple Questions

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- What is Self-consciousness? Sentience? Life?

Issues with Morality and AI

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- Should we manipulate data for “good”? (and counter-act bias?)

Example: Insurance Onboarding

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Car Insurance Claims Data

The data contains

- driving related:
  - average daily travel
  - professional or private use
  - living in urban or city area
- car related:
  - type of car (eg. minivan, sports car, sedan, etc.)
  - age of the car
- behaviour on our books:
  - time with us
  - old claims
- driver related:
  - has driver's licence been revoked
  - penalty points on driver's licence
  - years on job (work related)

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. . . but also contains

- related to gender and family:
  - number of kids at home
  - single parent or not
  - marital status
  - gender
- education and profession
  - education
  - occupation
- wealth related:
  - value of the car
  - value of the home

We call these the **"protected features"**

The cost of being politically correct?

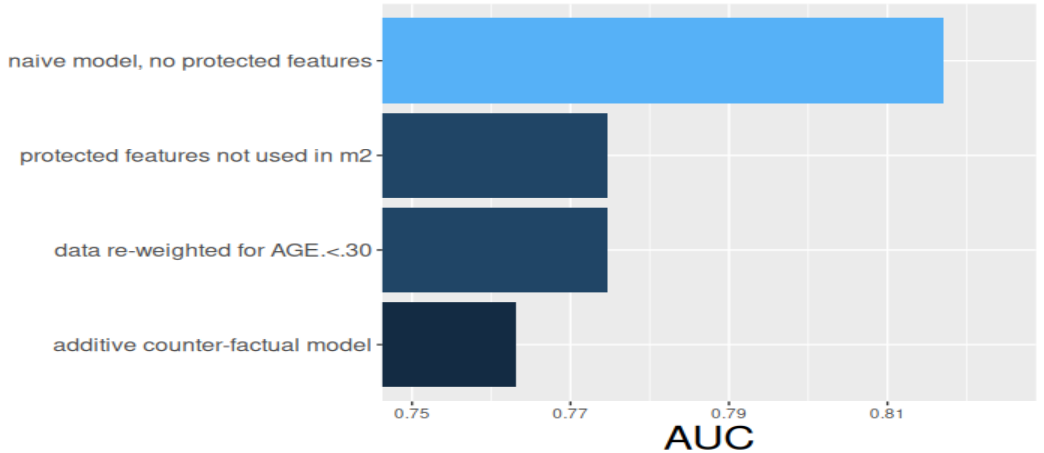
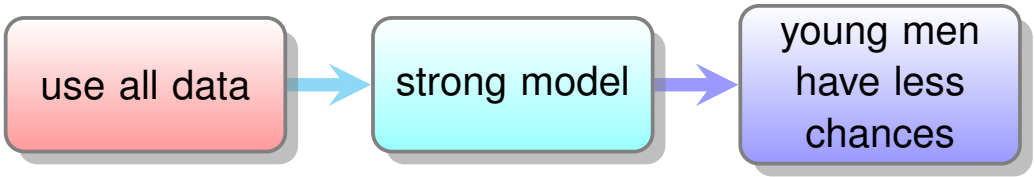


Figure: The discriminating power of different models. The higher the AUC, the stronger the model, the lower the losses on the portfolio, the higher profit (or lower prices) can be.

How to avoid bias? Two alternatives



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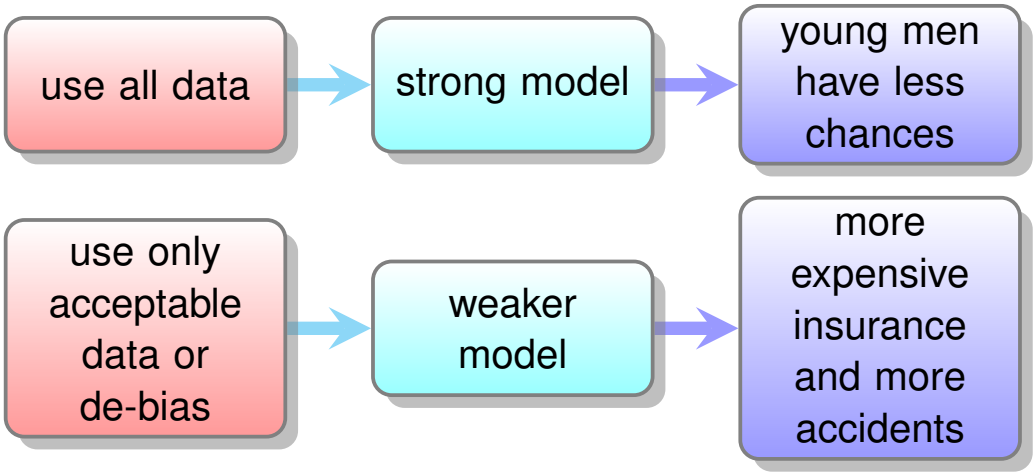
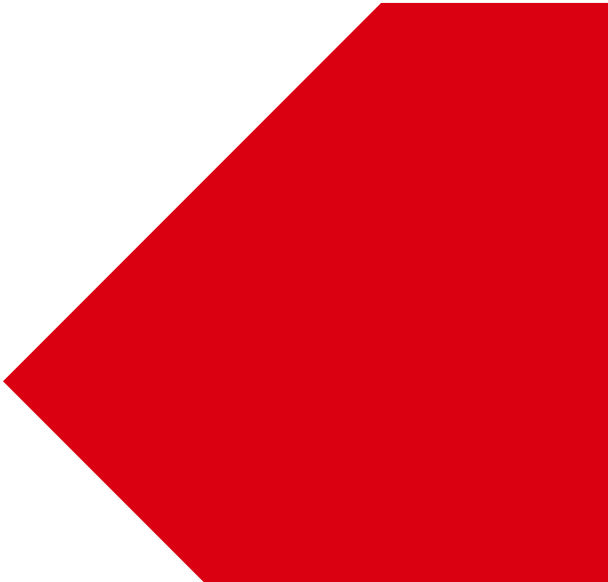


Ethics in Data Science



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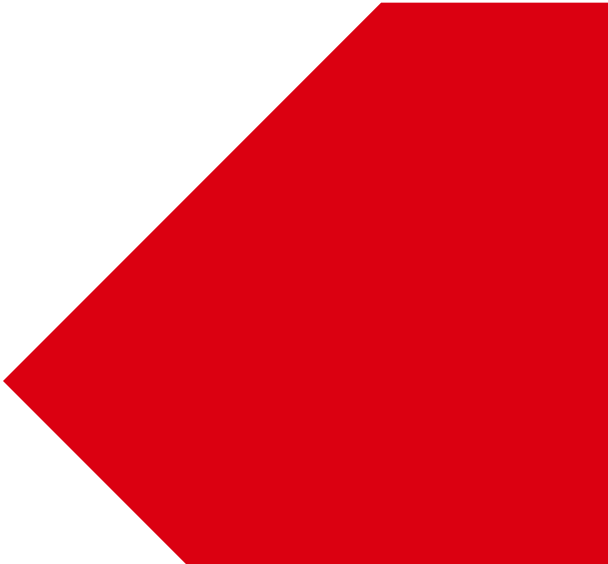
Some Issues

- user consent
- privacy, data protection
- intellectual property rights, data ownership
- safekeeping: avoiding data theft, cyber security
- trust, surveillance, free will
- competition
- discrimination:
  - bias
  - fairness
  - accountability
  - transparency

Conclusions



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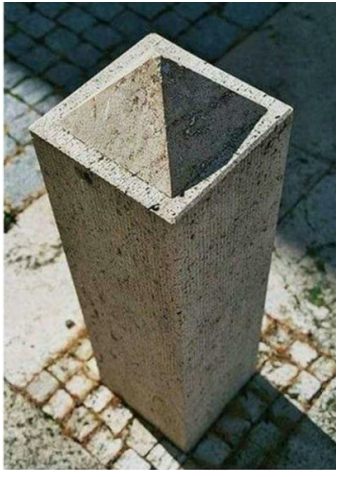
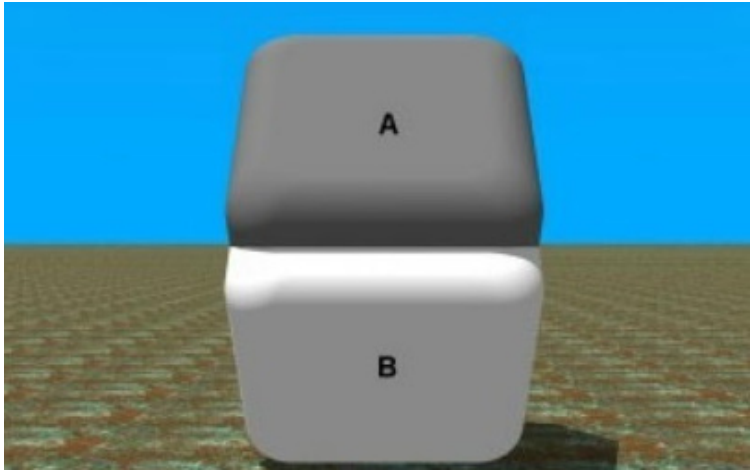
Visual Bias 1



(A) This is a cement pole with a pyramid on top
(B) This is a hollow cement pole (the shadow is inside the pole)

Visual Bias 2



(A) A and B are the same shade of grey
(B) the area B is a lighter shade of grey than A

Fairness is a matter of perspective

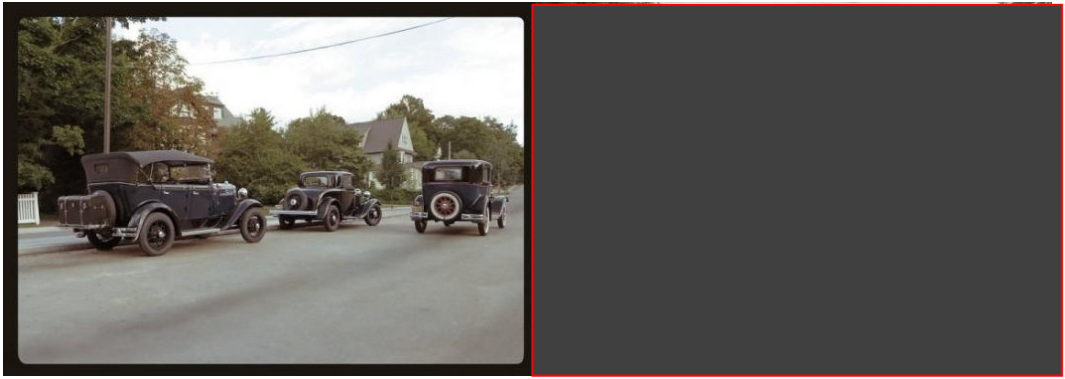


Figure: Fairness is a matter of perspective

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Bias is learnt

Figure: Bias is assuming a solution based on what you have learnt before. It can be useful, but usually is limiting.

Conclusions

Intuition

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Perspective

Subjectivity: Ethical stance depends on perspective.

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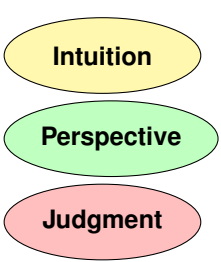

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Context: Morality cannot be reduced to fixed rules but requires context-sensitive judgment.

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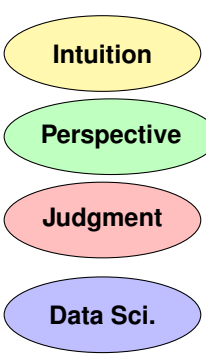

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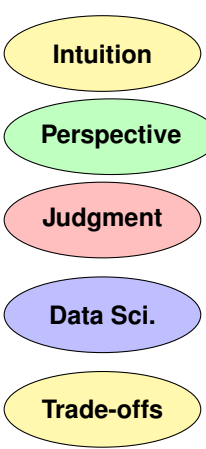

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New Dilemmas: Data science presents unique ethical dilemmas involving fairness, bias, and accountability.

Responsibility: Ethical decision-making involves navigating trade-offs with no perfect solutions; responsibility matters.

Thank you for your attention!

handouts

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