

Ethical Dilemmas when using Models and Data

Data Science in Practice

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AGH University of Krakow

- 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

Ethics

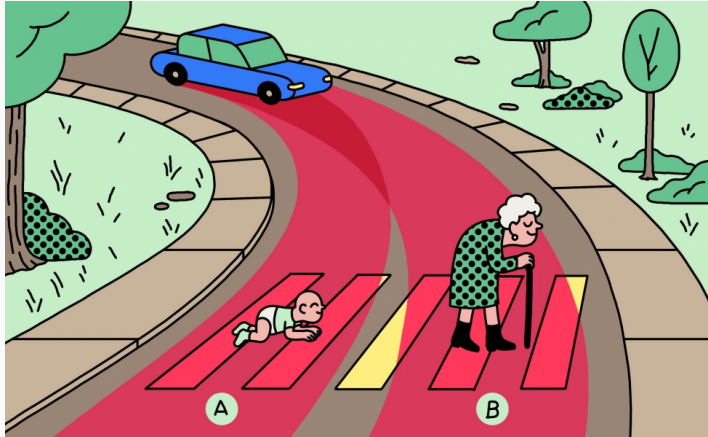
the study of what is morally right and wrong, or a set of beliefs about what is morally right and wrong.

Does it need to be difficult?



Figure 1: Two monkeys are paid an unequal reward - Frans De Waal / TED — Brosnan and De Waal, 2003

AI Dilemma: Kill/Save the Baby or Old Person?



(A) steer right and kill the baby

(B) steer left and kill the old person

The AI version of the Trolley Problem



Figure 2: source: Science — Bonnefon, Shariff, and Rahwan, 2016

Is it ethical to remove the house of a squirrel to build your house?



- (A) it is ethically acceptable to remove a tree that houses a squirrel to build your house
- (B) it is *not* ethically acceptable to remove the tree

Is it ethical 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 – we accept to be culled
- (B) no – we resist

What is ethically acceptable depends on your viewpoint



Figure 3: Ethics is complex and it depends on your point of reference and you frame.

Defining Artificial Intelligence

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

Defining AI Leaves Simple Questions Open

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SERIAL 274-N401904-0213 MODEL 3.0

⬆	HEIGHT	168 CM
⬆	BODY TYPE	SLENDER
⬆	FACE TYPE	CLASSIC
⬆	SKIN TONE	OLIVE
⬆	EYE COLOR	BROWN
⬆	LIP COLOR	NEUTRAL
⬆	HAIR COLOR	BRUNETTE
⬆	HAIR STYLE	BANGS
⬆	ETHNICITY	CUBAN
⬆	LANGUAGE	ENGLISH

EMANATOR DETECTED



CONNECT

JOI AND JOI POWER TECHNOLOGIES PROPERTY OF WALLACE CORPORATION
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Example: Insurance Onboarding

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

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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

These are the “**protected features**”

The cost of being politically correct?

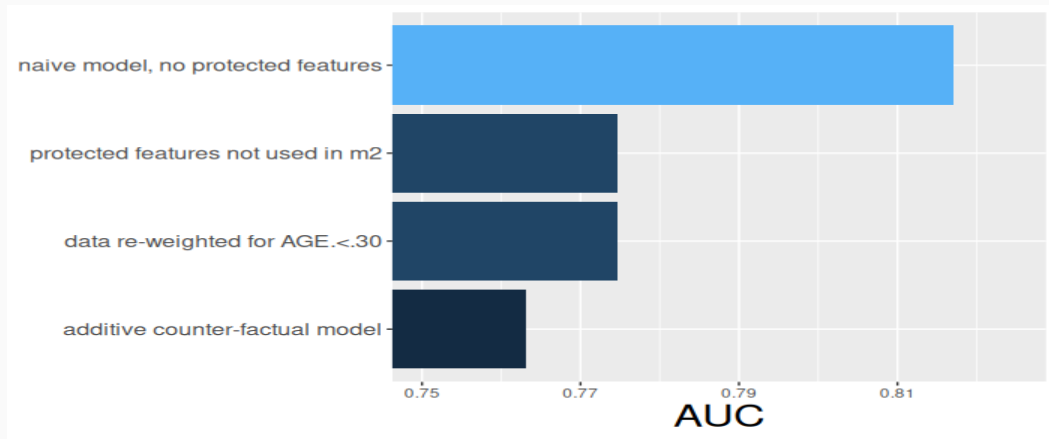
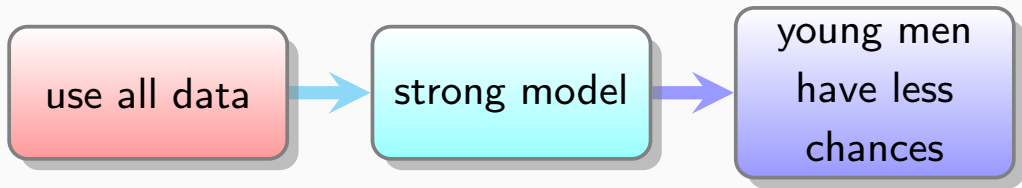
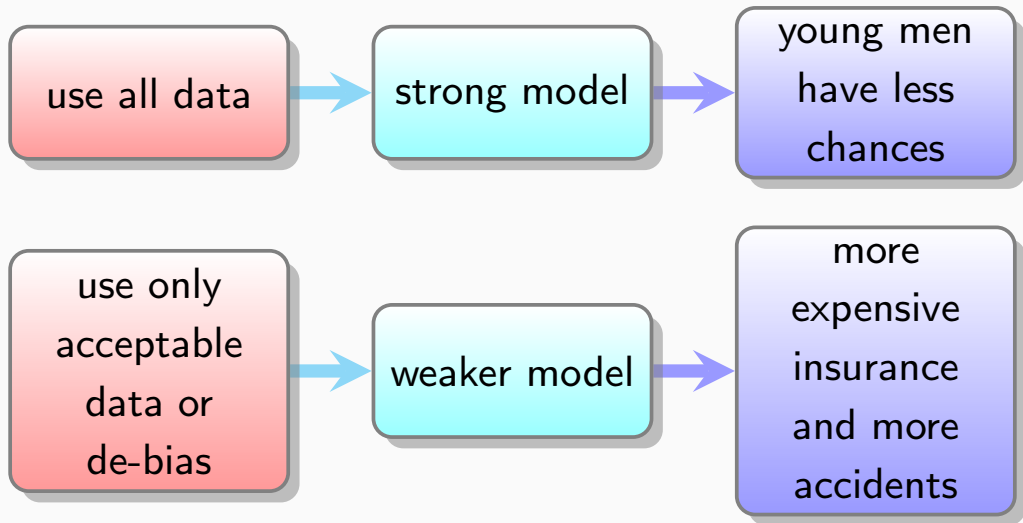


Figure 4: The discriminating power of different models. The higher the AUC, the stronger the model, the lower the losses on the portfolio, the higher profit (or lower prices) can be.

How to avoid bias? Two alternatives

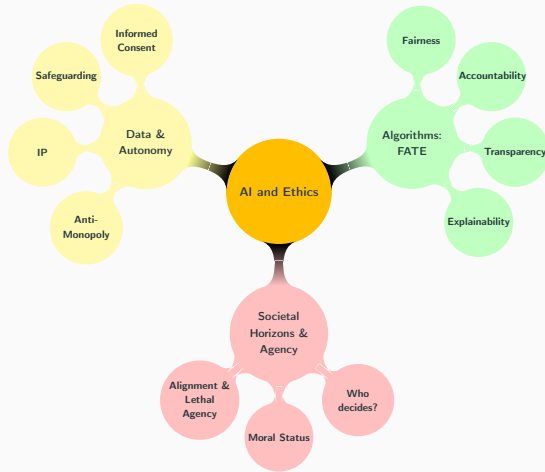


How to avoid bias? Two alternatives



Further Ethical Conundrums

AI Governance & Ethical Horizons



Conclusions

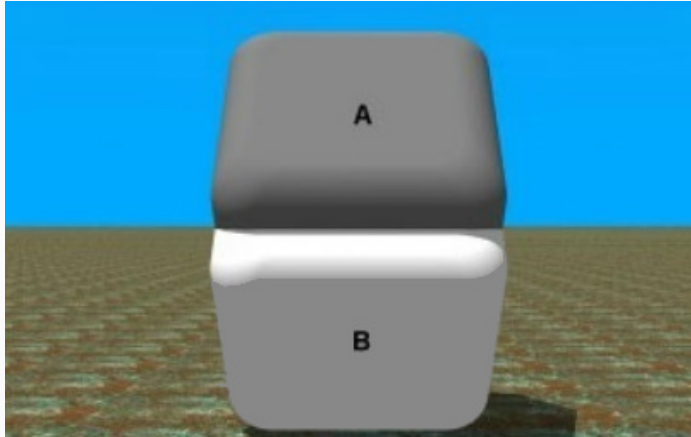
Visual Bias 1



(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 5: Fairness is a matter of perspective

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Innate **ethical intuitions** are insufficient for AI.

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Subjectivity: Ethical stance depends on perspective.

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Context: Morality requires context-sensitive judgment.

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Balance: Ethical decision-making involves trade-offs

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Responsibility

You have an individual and non-transferable responsibility.

Thank you for your attention!



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