

# Ethical Dilemmas in AI and Financial Services

## **Presentations Philippe DB**

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**Date:** 2026-05-09



# 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

## A Formal Definition – Cambridge Dictionary

### **Ethics**

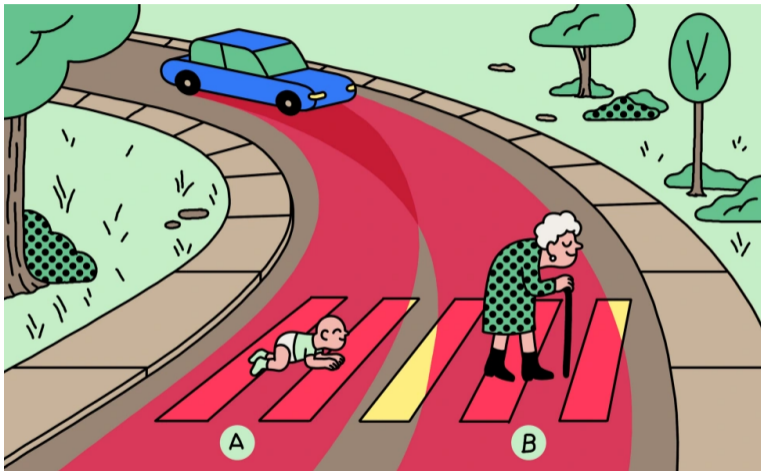
the study of what is morally right and wrong, or a set of beliefs about what is morally right and wrong.

## 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) turn right 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

- (A) turn right and kill the driver
- (B) kill the people on the street

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

# 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

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- ◆ What is Self-consciousness? Sentience? Life?

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

# Example: Insurance Onboarding

# 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

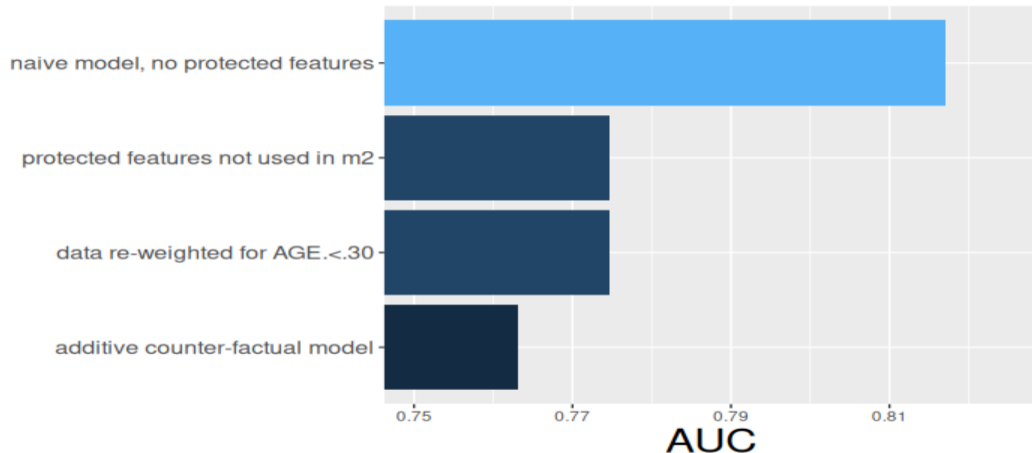
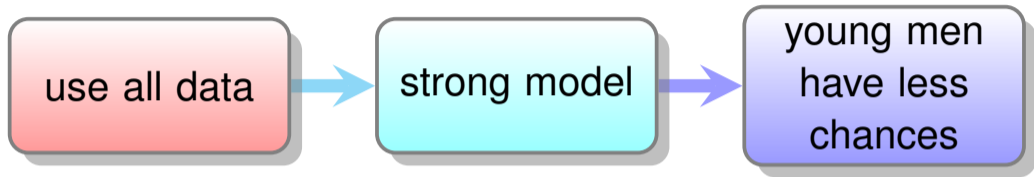
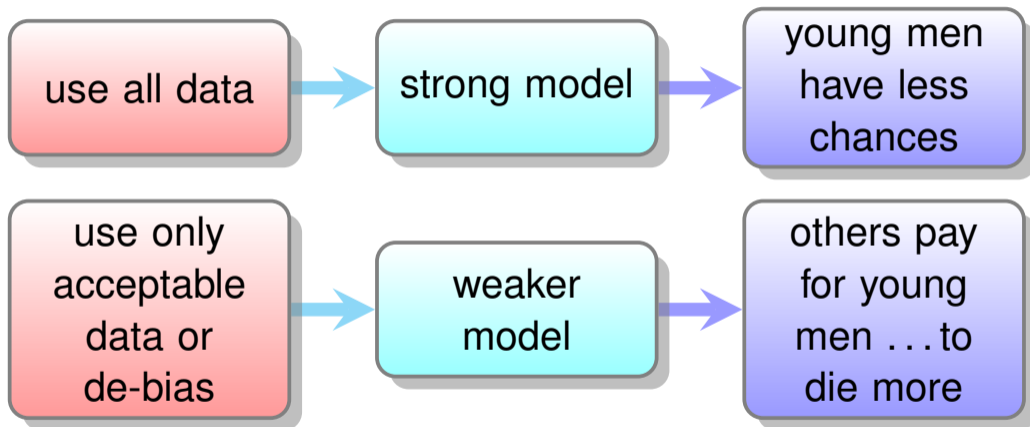


Figure: The discriminating power of different models. The higher the AUC, the stronger the model, the lower the losses on the portfolio, the higher profit (or lower prices) can be.

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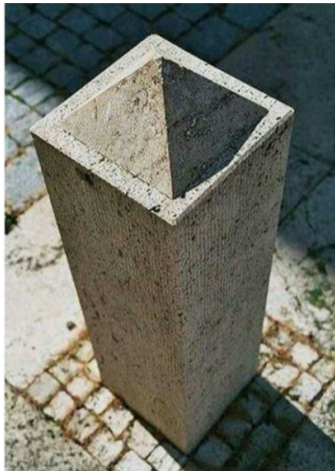
# Ethics in Data Science

# 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

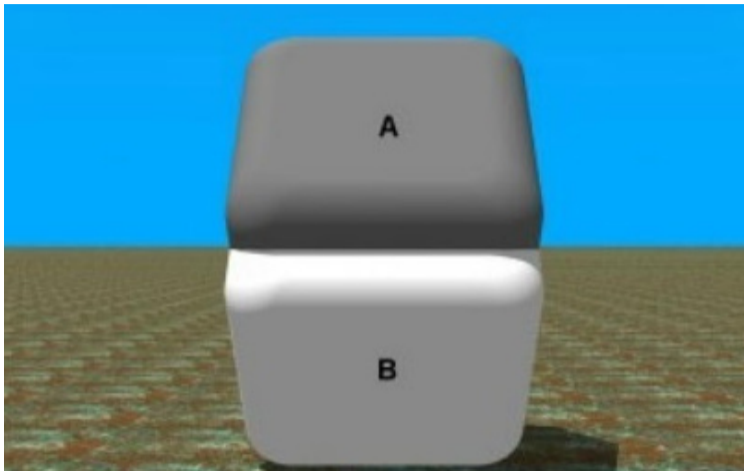
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# Visual Bias 1



- (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.

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4. Morality cannot be reduced to fixed rules but requires context-sensitive judgment.
5. Data science presents unique ethical dilemmas involving fairness, bias, and accountability.
6. Ethical decision-making involves navigating trade-offs with no perfect solutions; responsibility matters.