DATA7002:Responsbible Data Science 2021

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Ethics and Data Science: Outline

Week One: Introduction

1. Thinking about Data Science
2. Practical ethics and the nature of moral inquiry (dilemmas and conflicts)

Week Two: The theoretical tools of philosophical analysis

3. Approaches to philosophical ethics

Week Three: Practical Application to Data Science

4. What is data and what is information?
5. Collection use and management of data and information
6. Australia's data landscape

Week Four: Decision-making and problem solving in data Science case analysis

7. Domain analysis: Research data, Non research data, Algorithm development (machine learning, AI, robotics) and The Practice/s of Data Science.

But first

https://course-profiles.uq.edu.au/student_section_loader/section_1/116885

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3. Approaches to philosophical ethics

Critical Thinking

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualising, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness.

(Scriven and Paul, 1987)

In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 47 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

You are captured in a room. . .

Listen carefully to the problem.

You have to determine the one question that you can ask to either person. Their response will enable you to work out the right path to freedom.

Some of you will know the answer to this problem, some will work it out quickly, sometimes we have to think hard to get the answer. When you know – don't tell anyone!

Answer next week!

Bat and ball

If a baseball and a bat cost $1.10 together, and the bat costs $1.00 more than the ball, how much does the ball cost?

Answer

Was your answer that the ball cost 10 cents?

If so, you'd be *wrong*.

Here's the solution:

- Although $1.00 + $0.10 does equal $1.10, if you take $1.00 – $0.10 you get $0.90, but the problem requires that the bat costs $1 more than the ball. So, the ball must cost $0.05, and the bat must cost $1.05 since $1.05 + $0.05 = $1.10

- Still not convinced? You can use algebra to solve the problem:
- First, let's set up the equation:
- x + ($1.00 + x) = $1.10
- $1.00 + 2x = $1.10
- 2x = $1.10 – $1.00
- 2x = $0.10
- Finally, solve for x:
- **x = $0.05**
- Check your work:
- x + ($1.00 + x) = $1.10, so
- $0.05 + ($1.00 + $0.05) = $1.10

- some claim that the 10 cent answer indicates that you are an intuitive thinker, and the 5 cent answer indicates that you solve problems analytically, rather than following your instincts.

Behavioural economist Daniel Kahneman explains why most people get this wrong:

- A number came to your mind. The number, of course, is 10: 10¢. The distinctive mark of this easy puzzle is that it evokes an answer that is intuitive, appealing, and wrong. Do the maths, and you will see. If the ball costs 10 ¢, then the total cost will be $1.20 (10¢ for the ball and $1.10 for the bat), not $1.10. The correct answer is 5¢. It is safe to assume that the intuitive answer also came to the mind of those who ended up with the correct number—they somehow managed to resist the intuition.

- Many thousands of university students have answered the bat-and-ball puzzle, and the results are shocking. **More than 50% of students at Harvard**, MIT, and Princeton gave the intuitive—incorrect—answer. At less selective universities, the rate of demonstrable failure to check was in excess of 80%. The bat-and-ball problem is our first encounter with an observation that will be a recurrent theme of this book: **many people are overconfident, prone to place too much faith in their intuitions. They apparently find cognitive effort at least mildly unpleasant and avoid it as much as possible.**

This excerpt comes from Kahneman's 2011 book, "Thinking, Fast And Slow," which posits that we have an intuitive mental system and a logical mental system, and we often use the wrong one at the wrong time.

Can we trust our intuitions?

Disease in Australia Case

Imagine that Australia is preparing for the outbreak of an unusual disease which is expected to kill 600 people. Two alternative programs (A&B) to combat the disease are proposed. Assume that the exact scientific estimates of the program are as follows:

- If A is adopted 200 people will be saved
- If B is adopted there is a one third probability that 600 people will be saved and two-thirds probability that no people will be saved

- Which of the two programs do you favor?

Consider these options

- If A* is adopted 400 people will die.
- If B* is adopted there is a one third probability that nobody will die and a two thirds probability that 600 people will die.

- Which do you favor?

Summary

V1

- *If A is adopted 200 people will be saved*
- If B is adopted there is a one third probability that 600 people will be saved and two-thirds probability that no people will be saved

V2

- If A* is adopted 400 people will die.
- *If B* is adopted there is a one third probability that nobody will die and a two thirds probability that 600 people will die.*

- Usually in version 1 most favour A, in version 2 most favour B*.
- A & A* are identical as are B & B*

People are significantly more likely to choose the option in which 200 people will certainly be saved over an apparently risky option when the description draws attention to lives lost rather than to lives saved.

Kahneman & Tversky

- People have an intuitive tendency to represent outcomes as involving 'gains' or 'losses' relative to an imagined baseline. People apply different decision-making rules depending on whether outcomes are represented as gains or as losses.

see the Nobel prize lecture 'A perspective on judgment and choice: mapping bounded Rationality, *American Psychologist* 58, 2003, pp 684-7

Connected levels of moral thought

Critical/Intuitive

Impartiality/Partiality

Critical Thinking

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualising, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness.

(Scriven and Paul, 1987)

A tool box for reasoning

a) Logical arguments

b) Conceptual analysis

c) Consistency and case comparison

d) Reasoning from theory (principles, consequences, virtues)

a) Logical Arguments

From Aristotle: The simplest but most important forms of argument are simply statements or 'premises'. From putting two statements together we can deduce or infer a third statement which constitutes a conclusion or a truth. This is called a *syllogism* (which in Greek just means 'a process of putting arguments together'). Here is a successful syllogism:

Premise 1:	All philosophers are human.
Premise 2:	Aristotle is a philosopher.
Conclusion:	Therefore Aristotle is a human.

Once he had defined the idea of the syllogism, Aristotle saw that most syllogisms fell into certain categories, depending on the form taken by the premise and the modifying adjectives – ‘all philosophers’ or ‘some philosophers’, for example. A modifier could even be negative – ‘no philosophers’ – for Aristotle realised that slightly more complicated syllogisms involve negative statements:

Premise 1:	Aristotle and Theo *are not both* at the Lyceum today.
Premise 2:	Theo is at the Lyceum today.
Conclusion:	Therefore Aristotle is not at the Lyceum today.

If both premises are true, the conclusion is certain to be true. *If* the premises are correct, a valid and useful conclusion can be drawn. The devil with formal logic, however, is in the detail. Here is a faulty, illogical conclusion:

Premise 1:	All Australians are human.
Premise 2:	Some humans like bananas.
Conclusion:	Therefore all Australians like bananas.

The first premise here is indisputable. Even the conclusion derives logically from the premises *if you accept them*. The problem lies in the second premise. Experienced philosophers, politicians and lawyers know well that the clever place to hide a logical problem or tendentious viewpoint is in the second premise.

Consider this:

Premise 1:	Intelligence reports tell us that Iraq holds weapons of mass destruction.
Premise 2:	We would not lie to you, distort or exaggerate evidence.
Conclusion:	Therefore we must invade Iraq and disarm Saddam Hussein.

Emotive language was used to draw attention away from the fuzzy glossing over of the details of the 'evidence' in Premise 1, and the appeal to their own moral integrity in Premise 2. Some Western leaders insisted that Iraq's weapons of mass destruction programme was 'active, detailed and growing', while Bush said that the invasion was necessary before Saddam 'threatens civilisation'. Blair & Howard agreed. Many other tragic historical events have been caused by failure of voters to see the invalidity of such a logical syllogism.

Logical Arguments

A logical argument is one such that if the premises are true, the conclusion must also be true.

Premise 1: All philosophers are human.

Premise 2: Aristotle is a philosopher.

Conclusion: Therefore Aristotle is a human.

Philosophy and analysis of data science cases proceeds by use of logical arguments (we hope!)

What is a **slippery slope argument**?

Slippery-slope arguments

Slippery slope argument, in logic, the fallacy of arguing that a certain course of action is undesirable or that a certain proposition is implausible because it leads to an undesirable or implausible conclusion via a series of tenuously connected premises, each of which is understood to lead, causally or logically, to the premise (or conclusion) that follows it. An example of a slippery slope argument is the following:

In 2012 during debate on marriage equality bills in the senate, Cory Bernardi argued that an acceptance of gay marriage would lead to an unravelling of the fabric of Australian society. He claimed that gay marriage was the first step on a slippery slope.

“The next step, quite frankly, is having three people or four people that love each other being able to enter into a permanent union endorsed by society - or any other type of relationship”.

But Bernardi went further down the slope from polygamy. He claimed:

“There are even some creepy people out there… [who] say it is okay to have consensual sexual relations between humans and animals. Will that be a future step? In the future will we say, ‘These two creatures love each other and maybe they should be able to be joined in a union? I think that these things are the next step.’”

Fallacy

https://kreativcopywriting.com/10-logical-fallacies-know-spot/

b) Conceptual analysis

- Provide definitions (e.g., data identifiability, type of data science problem; elucidate concepts (persons best interest, consent, privacy), make distinctions (consent in research and practice, data and information, identifiabilty); identify similarities (do universal principles apply – why? why not?)

c) Consistency and case comparison

- If you conclude that you should make different decisions, or do different thing in in similar situations, you must be able to identify a moral/ethical difference between the two situations. Otherwise you are being inconsistent.

d) Reasoning from theory (principles, consequences, virtue)

- The essence of ethical reasoning

3. Approaches to Philosophical Ethics

OK . . .

- Let's assume that people are basically selfish. If we cannot appeal to natural purpose or altruism is there anything left to base morality on?

- *Morality should be understood as the solution to a practical problem that arises for self-interested human beings.* Four basic facts of life: equality of need, scarcity, the essential equality of human power, limited altruism. (Thomas Hobbes in the 17th century). In order to work together we must agree on certain rules – *the social contract.*

- *Wherever law ends tyranny begins*… John Locke, The second treatise of government 1690

However . . .

- there is a *troubling objection* – the social contract relies on rational people accepting rules of mutual benefit. We know that some individuals cannot benefit us. Therefore, according to the social contract, these individuals have no claim on us; we may ignore their interests when were writing up the 'mutually beneficial' rules of society. This implication is unacceptable to many. There are at least three vulnerable groups:
  - Non-human animals
  - Future generations
  - Oppressed populations

The social contract theory is grounded in self-interest and reciprocity; thus it may be unable to recognize the moral obligations we have to those who cannot benefit us. So we can look elsewhere (as well).

Jean-Jacques Roussea - The Social Contract (1762)

- Morality consists in the set of rules, governing behavior, that rational people will accept, on the condition that others will accept them as well.

- The social contract is a useful analytical tool

Three broad approaches (methods) in ethics

1) **Principles.** Non-Consequentialism (deontology)
2) **Consequences.** Consequentialism (utilitarianism)
3) **Virtues.** Virtue Ethics

1. Principles. Non-Consequentialism (deontology)

- Kantianism

- Immanuel Kant (1724-1804), Categorical Imperative, Universal laws, Principles (ABNJ)

Universal laws?

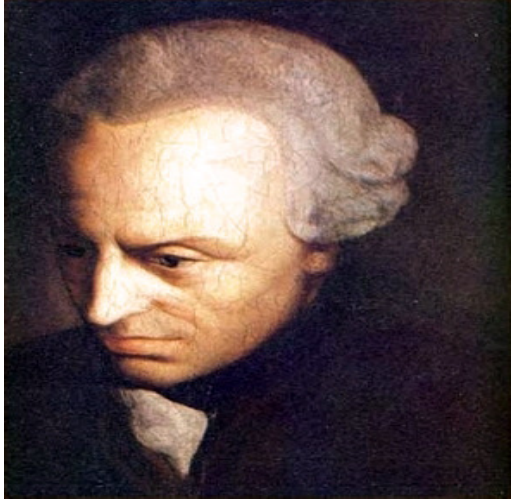
- Kantian Ethics has given rise to the principles approach to Applied ethics.

From ancient times philosophers have expressed the ideas that ethical conduct is acceptable from a point of view that is *universal*

Can you identify an ethical principle that could or should be applied universally?

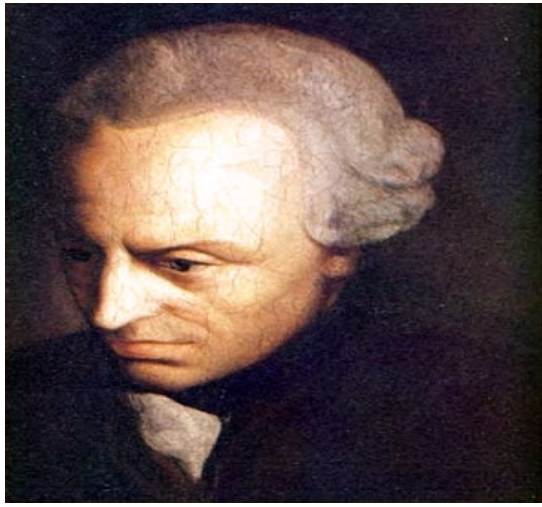
Can you identify a data science ethical principle that could or should be applied universally?

Non- consequentialism (deontology)



- Kantian Deontology from Immanuel Kant (1724-1804)
- Three formulas of Kant's overarching moral principle in his *Groundwork for the Metaphysics of Morals (1785)*

1) Principles. Non-Consequentialism (deontology)



- Categorical Imperative I: **Act only according to those maxims that you could consistently will to be universal laws.**
- Categorical Imperative II: **Never treat a person (whether one's self or another) as a *mere means* but always also as an end in herself/himself.**
- Categorical Imperative III: Act in accordance with the maxims of a member giving universal laws in a Kingdom of Ends, or in other words, **act only on principles which could earn acceptance by a community of fully rational agents each of whom have an equal share in legislating these principles for their community.**
- Kant thought these three imperatives were equivalent.
- Kant argued they represent universal general moral principles which are comprehensive in their application. That is, for any example of morally impermissible behaviour, these principles should offer an explanation.

For Kant (1724-1804) the practical imperative will be to . . .

Act in such a way that you always treat humanity, whether in your own person or in the person of any other, never simply as a means, but always at the same time as an end.

(Groundwork of the Metaphysics of Morals, 64-6)

Parfitt

Kant's Formula of Universal Law, the formula that Kant had claimed to be the supreme principle of morality: *"I ought never to act except in such a way that I could also will that my maxim should become a universal law."*

Parfit's version that seemed to him to combine the best elements of Kantianism and consequentialism: **"Everyone ought to follow the principles whose universal acceptance everyone could rationally will."** He argued that these principles would be the same ones that were espoused by rule consequentialism.

Principle based ethics (non-consequentialism)

Four Moral Principles:

- Autonomy
- Beneficence
- Non-maleficence
- Justice

Autonomy

Individual autonomy is an idea that is generally understood to refer to the capacity to be one's own person, to live one's life according to reasons and motives that are taken as one's own and not the product of manipulative or distorting external forces, to be in this way independent. It is a central value in the Kantian tradition of moral philosophy but it is also given fundamental status in John Stuart Mill's version of utilitarian liberalism (Kant 1785/1983, Mill 1859/1975, ch. III).

Stanford Encyclopedia of Philosophy 2020

Consent

"strong reasons to accept some version of the consent principle. This principle may be too demanding, and there may be some other ways in which it should be revised. But at least in most cases, it is wrong to act in ways to which anyone could not rationally consent."

Derek Parfit 2011

Informed Consent

- In relation to decisions about what is proposed

I + U -> C
C + V = ID

Information + Understanding- Competence
Competence + Voluntariness = Informed decision

Ref: Crowden A (1992), *Patient Competence and Informed Consent: Development of a model for effective and ethically justifiable competence evaluation in clinical situations*, Masters Thesis, Centre for Human Bioethics, Monash University, National Library of Australia

Informed decision-making (consent)

In relation to decisions about participation in proposed treatment or research:

I + (U + A) = C
C + V = ID

Information + (Understanding + Abilities**) =Competence*

Competence + Voluntariness = Informed decision

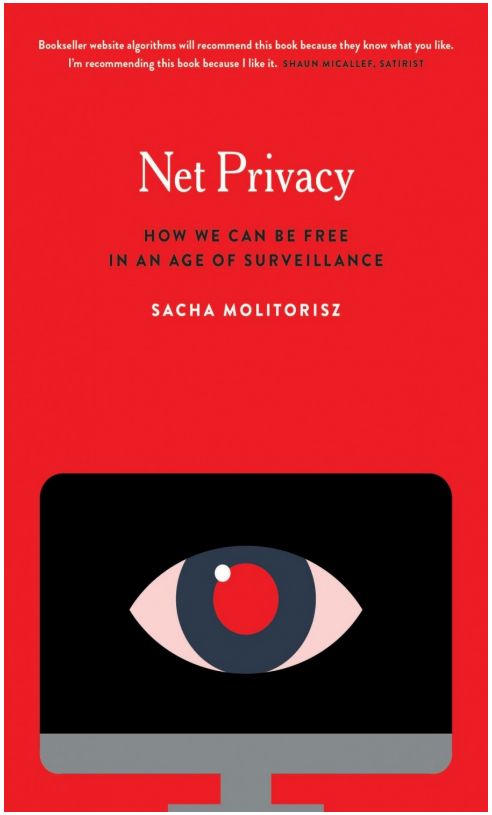
**understanding of disclosed information*

***ability to appreciate a situation and its likely consequences, ability to manipulate information, ability to communicate a choice, (all often influenced by a participant's affective and/or emotional state)*

(Crowden A., 2013)

Individual consent is a mechanism that ensures we are not using others *merely* as a means.

As such the consent of individuals must be valued and respected.



Consent

Specific, extended, non-specific, waived

Non-Maleficence

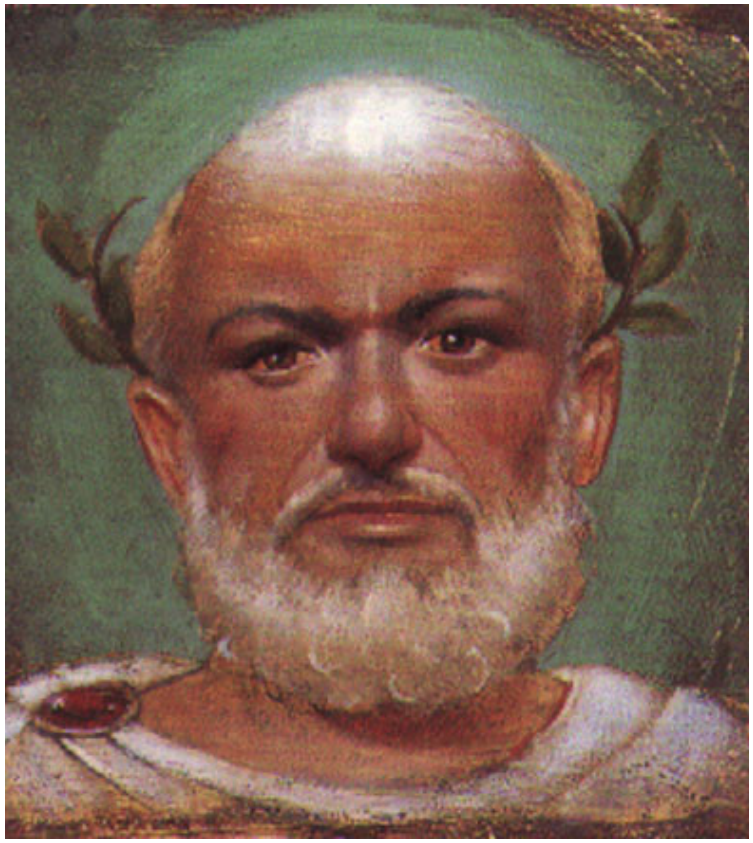


Image from www.hairdoc.com

Hippocrates - 4th century BC

Primum non nocere

"first of all, do no harm"

Non-maleficence

An equivalent **phrase is** found in Epidemics, Book I, of the Hippocratic school: "Practice two things in your dealings with disease: either help or **do not harm** the patient". The exact **phrase is** believed to **have** originated with the 19th-century English surgeon Thomas Inman (1820-1876..

Beneficence

- Refers to a moral obligation to act for the benefit of others

- The term *beneficence* connotes acts or personal qualities of mercy, kindness, generosity, and charity. It is suggestive of altruism, love, humanity, and promoting the good of others. In ordinary language, the notion is broad, but it is understood even more broadly in ethical theory to include effectively all norms, dispositions, and actions with the goal of benefiting or promoting the good of other persons. The language of a *principle* or *rule* of beneficence refers to a normative statement of a moral obligation to act for the others' benefit, helping them to further their important and legitimate interests, often by preventing or removing possible harms.

SEP 2008

Justice

- Pertains to the treatment of persons that is fair and that concerns what persons are due or owed.
- There is no single principle of justice
- Equals should be treated equally and unequals unequally.

Rawls (A Theory of Justice 1971)

The first principle is often called *the greatest equal liberty principle.* The second, *the difference principle* and *the equal opportunity principle*

The greatest equal liberty principle

- “each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others.”

- Mainly concerned with distribution of rights and liberties, the basic liberties of citizens are the political liberty to vote and run for office, freedom of speech and assembly, liberty of conscience, freedom of personal property and freedom from arbitrary arrest. However, it is a matter of some debate whether freedom of contract can be inferred to be included among these basic liberties

The difference principle

- Social and economic inequalities are to be arranged (a) so that they are to be of the greatest benefit to the least-advantaged members of society, consistent with the just savings principle

The equal opportunity principle

- Social and economic inequalities are to be arranged (b) so that they are to be of the greatest benefit to the least-advantaged members of society, consistent with the just savings principle

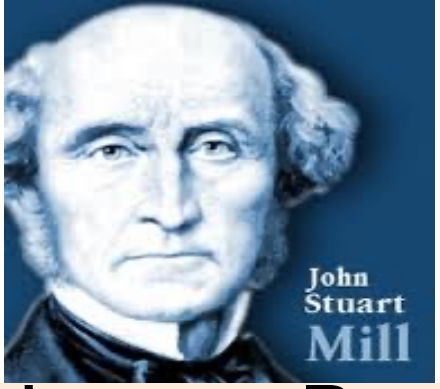
Distributive Justice

1) To each person an equal share
2) To each person according to need
3) To each person according to effort
4) To each person according to contribution
5) To each person according to merit
6) To each person according to free-market exchanges

2) Consequences. Consequentialism (utilitarianism)

Utilitarianism proposed by David Hume (1711-1776), given form by Jeremy Bentham (1748-1832) and John Stuart Mill (1806-1873), grounded in ideas related to liberty-equality-fraternity

Individual pleasure/Greatest happiness of the greatest number/ pleasure pain balance/act, rule, preferences



2) Consequences. Consequentialism (utilitarianism)

- Jeremy Bentham (1748-1832) and John Stuart Mill (1806-1873) sought to give an objective, rational basis for morality, not unlike a kind of mathematical formula.

- Pure consequentialism: consequences are the **only** relevant consideration in morality. Rights, duties, desert, or procedural justice, may be justified because recognising them **in general** maximises good consequences. This leads to a distinction between **act**, **rule**, and **institutional** utilitarianism.

- The Fundamental Principle of Utilitarianism: **Actions are right in so far as they produce greater net utility than available alternatives.** The fundamental idea of consequentialist theory is that in order to determine whether an action would be right, we should also look at what will happen as a result of doing it.

3) Virtue Ethics

- Virtue ethics focuses on our character, rather than solely on our actions.

- Some call virtue ethics character ethics

Virtue Ethics

- Virtues are trained behavioural dispositions that result in habitual acts of moral goodness.
- Plato's cardinal virtues – wisdom, temperance, courage and justice.
- Paul's theological virtues – faith, hope and charity
- Hinduism – non-violence, truth, purity and self control
- Confucius – courtesy, generosity, honesty, persistence and kindness
- Islam –Charity and philanthropy, forgiveness, tolerance, honesty, kindness and leniency, kind treatment to animals, justice, fulfillment of promise, modesty and humility, trustworthiness, patience, truthfulness, sincerity.
- Jesus – love, empathy, care
- Aristotle - Courage, Generosity, Honesty, Compassion, Self-Respect

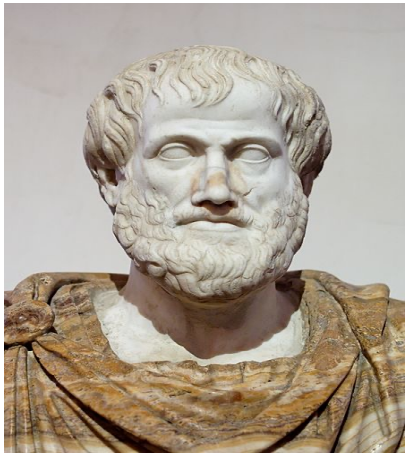
Virtue Ethics

. . . tells us that what is right is to be a certain kind of person, a person of virtue: courageous, modest, honest, evenhanded, industrious, wise. A virtuous person will, of course, express his or her virtue through action. But for virtue ethics the rules of right action is largely a secondary matter – one that in many ways presumes the kind of practical wisdom possessed by the person of virtue.

(Zwolinski & Smith in the Cambridge companion to Virtue ethics, 2013, p.221)

3) Virtues. Virtue Ethics

- Aristotle (384-322 BC) Nicomachean Ethics
- Aristotle connected ethics to “eudaimonia” or flourishing for human beings, which itself was connected to the natural human capacity for rational thought.
- **Virtue ethics focuses on character, rather than actions.**
- **Virtues are character traits, involving habits of action, attitudes and the disposition to certain feelings**. Becoming virtuous requires practice, reflection, and cultivation of those character traits which contribute to a flourishing life.
- **The virtuous individual is someone who, without relying completely on rules or principles, is sensitive and intelligent enough to perceive what is noble or right as it varies from circumstance to circumstance.**
- Courage, Generosity, Honesty, Compassion, Self-Respect are examples. Aristotle offered detailed accounts of each of these virtues as a “mean” between two extremes of excess and deficiency
- **Phronesis**, Aristotle’s term for practical wisdom, refers to the capacity to choose wisely how to act with virtue in particular contexts, where this requires experience, maturity, sensitivity, careful reflection, for example, where the virtues seem to conflict.



Virtue Ethics

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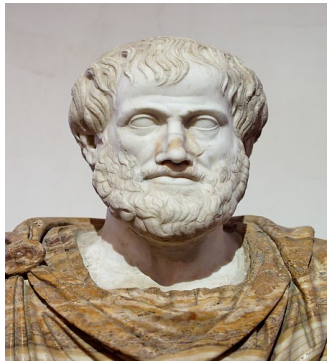
Virtue Ethics



- **Phronesis**, Aristotle's term for practical wisdom, refers to the capacity to choose wisely how to act with virtue in ***particular contexts***, where this requires experience, maturity, sensitivity, careful reflection, for example, where the virtues seem to conflict.

- Virtue ethics holds that it is important not only to do the right thing but also to have the proper dispositions, motivations and emotions in being good and in doing right.

- Virtues are excellences in character - acculturated behavioural dispositions that result in habitual acts.

For the consequentialist, a data scientist doing X would be right, in the end, because doing X is expressive of a mode of practice which, when engaged in collectively, maximises utility. For the virtue ethicist, however, a data scientist doing X would be right because doing X is expressive of what the profession of data science actually is, considered as an activity which is committed to one important substantive human goods (goals of data science), which itself is partly constituitive of a humanly flourishing life.

(adapted from doctoring analogy Oakley J & Cocking D., Virtue Ethics and Professional Roles, Cambridge University Press Cambridge, UK 2001, pp 114-15.)

Virtues of Science

Universalism

Disinterestedness

Communality

Organised scepticism

Robert Merton (1942)

What are the virtues of Data Science?

- **What are the virtues of data science?**

•Virtue ethics focuses on character, rather than actions.

•Virtues are character traits, involving habits of action, attitudes and the disposition to certain feelings.

- Becoming virtuous requires practice, reflection, and cultivation of those character traits which contribute to a flourishing life.

The virtuous individual is someone who, without relying completely on rules or principles, is sensitive and intelligent enough to perceive what is noble or right as it varies from circumstance to circumstance.

First, identify the intellectual virtues of data science – those that can be taught about data science . . .

Then, identify the moral virtues, the regulative ideals of data science practice – those that are learned or inculcated from habit (from doing data science) . . .

See what others say, have an on-line conversation with at least one other student . . .

Data Science Association Code of Professional conduct

1 – Terminology

Data Scientist – client relationship

2 – Competence

3 – Scope of data science professional services between client and data scientist

4 – Communication with clients

5 – Confidential information

6 – Conflicts of interest

7 – Duties to prospective client

8 – Data science evidence, quality of data and quality of evidence

Maintaining the Integrity of the Data Science Profession

9 – Misconduct

(we need to embed privacy, consent, confidentiality, discrimination, ownership, commercialisation, intellectual property and the importance of fair benefit sharing, conflicts of interest and *the need to ensure equity, reciprocity and respect for cultural diversity.*

The competing claims of the comprehensive theories

- Consequentialism, non -consequentialism and virtue ethics offer competing claims about the foundations of morality, at least in some cases, but this does not mean we need to choose only our favourite theory in research ethics review.

- There is wide consensus among ethical theorists that each of the 3 theories set out above contains important insights into the nature of morality. Each might emphasise different aspects or features of a complex moral terrain.

- Most complex ethics cases will require a balancing of various values and principles. One will need to reflect on issues raised by a full range of principles and theories, determine whether any are overriding, and develop a justification for the balance that is struck between any competing concerns

It was Aristotle who was the first philosopher to describe in practical terms the best way to make a decision, written in a lively, matter-of-fact manner without complicated jargon. The method entails deliberating competently about all alternative courses of action which may or may not conduce to achieving your goals, attempting to anticipate the consequences of each course of action, and then choosing and sticking to one.

Aristotle's formula for moral deliberation

Define the problem – is there a choice? A problem well defined is a problem half solved (John Dewey who admired Aristotle).

1. Don't deliberate in haste
2. Verify all information
3. Consult and listen to an expert advisor
4. Consult or at least look at the situation from the perspective of all parties who will be affected.
5. Identify and examine all known precedents
6. Try to calibrate the *likelihood* of different outcomes and prepare for every single one you think is possible

Tutorial activity week two

- please **reflect on what ethics is, what does ethics mean for you?**
- **Is ethics relevant to my work in data science? Why is ethics relevant? Why is ethics not relevant.**

- **Read** Luciano Floridi and Mariarosaria Taddeo

A practical ethics decision-making framework for data science

Don't deliberate in haste

1. Define the problem - who does/may it affect? *who* may be involved/affected What facts are available? Are there any precedents?
2. Verify all information. Is there any other information you would request that has not been provided? Is expert advice needed?
3. Identify and consider ethical principles/rules/virtues relevant to this case and explain why you think they apply – consider specific ethics frameworks, Identify and explain if there are different perspectives that should be considered?
4. Consider the law. Broadly, what areas of law could be called upon to help with this case? Consider relevant ethical guidelines/policy.
5. Based on your analysis derived from answering questions 1-6, explain what you think is the most ethically and/ or legally sound response?
6. Calibrate the *likelihood* of different outcomes and prepare for every single one you think is possible. Evaluate your choice.

Ethics and Data Science: Outline

Week One: Introduction

1. Thinking about Data Science
2. Practical ethics and the nature of moral inquiry (dilemmas and conflicts)

Week Two: The theoretical tools of philosophical analysis

3. Approaches to philosophical ethics

Week Three: Practical Application to Data Science

4. What is data and what is information?
5. Collection use and management of data and information
6. Australia's data landscape

Week Four: Decision-making and problem solving in data Science case analysis

7. Domain analysis: Research data, Non research data, Algorithm development (machine learning, AI, robotics) and The Practice/s of Data Science.