



BUSA6430/3430: Business Applications of AI

S1 2025

Unit convenor: Prof. Olivera Marjanovic, PhD (Professor of Business Analytics), ASBA



Week 1 agenda

Part 1: Intro to the Unit

- Introductions and setting the scene
- Unit objectives, activities and assessments
- Class structure & expectations (mine and yours)
- Q&A

Part 2: Topic 1: Intro to Business Applications of AI

- What is AI?
- History of AI
- Different definitions and perspectives
- Benefits of AI
- Challenges and harmful effects
- Different types of AI
- AI Risk framework



Your Team:

UC: Professor Olivera Marjanovic (ASBA)

Lecturers:

Lecture 1 (Mon 11am -1pm) – Dr. Masoud Afshari Mofrad (ASBA)

Lecture 2 (Mon 1 - 3pm) – Prof. Olivera Marjanovic (ASBA)

Lectures 1 and 2 (Weeks 8, 9, 10 and 12) – Dr. Xiaohan Yu (CS)

Tutors/Seminar leaders:

- Dr. Mahdi Kasef
- Dr. Aaron Chakerian
- Prof. Olivera Marjanovic
- Dr. Masoud Afshari Mofrad



About this unit

This unit looks at practical applications of AI systems in a business context, including how AI systems could be deployed, integrated with other business systems, maintained in the longer term, and used in ethical and responsible ways to create business and societal value.

The unit takes a **business rather than a technical perspective** and focuses on **developing AI-related business skills and capabilities** which will **remain** relevant in the world of **fast-changing AI technology**.

The topics will cover the Socio-technical view of AI; Business frameworks for AI; AI-enabled Business models; AI data & analytics core; different aspects of AI-enabled Business value creation, Principles and practices of Responsible AI as well as Future of work, business and humanity in AI era. The unit also introduces foundations of AI technologies suitable for business and other non-technical users and managers of AI.



How does this combined unit work?

BUSA3040 AND BUSA6430 (CO-BADGED STATUS)

Quality assurance during unit design and implementation

Why a combined unit? How does it work? Will it offer the same learning experience to the undergrad and postgrad students?

BUSA3040 and BUSA6430 have:

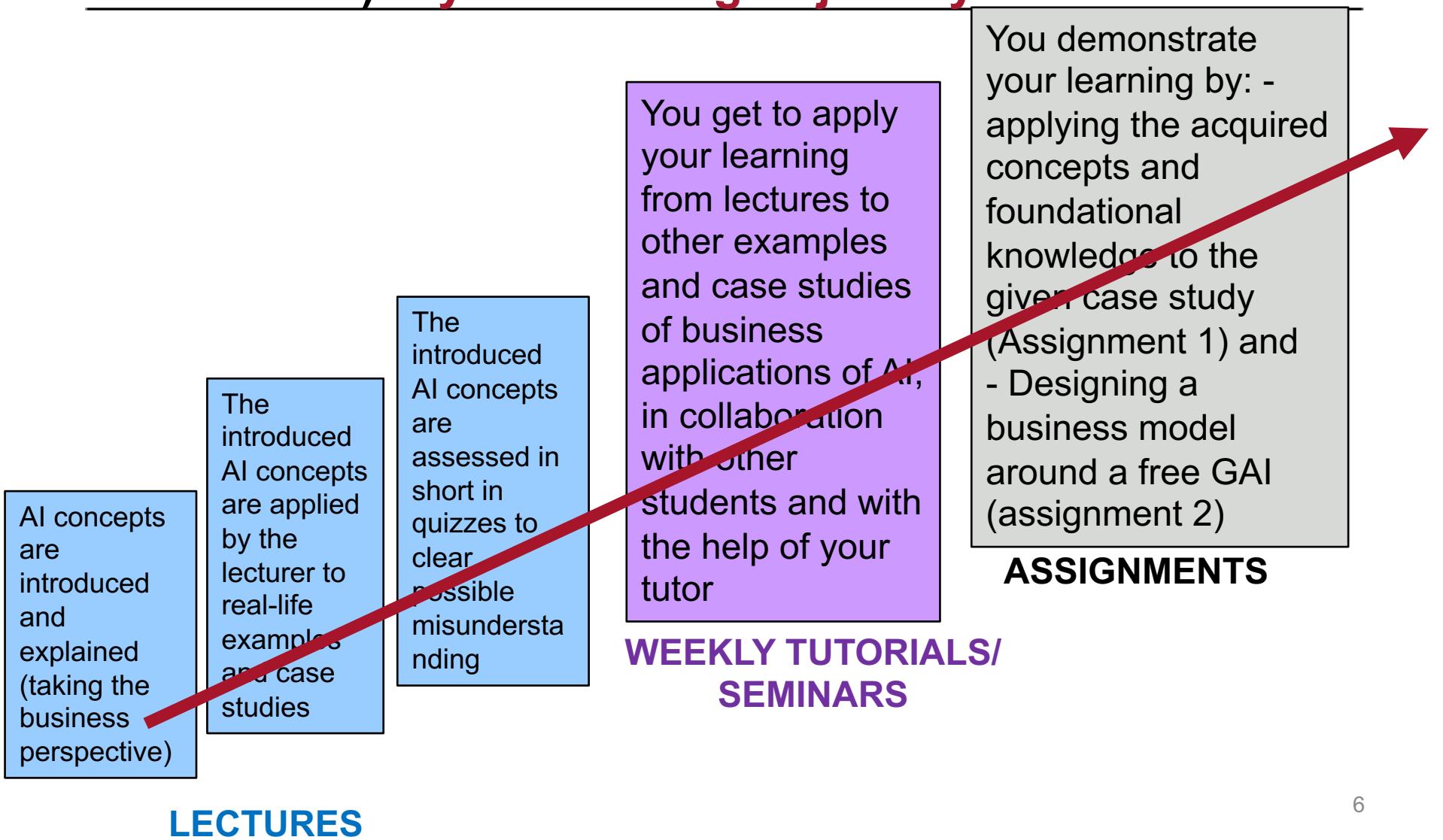
- Separate iLearn sites
- Separate tutorials
- Different individual and group assignments (at different RQF levels)
- Consequences for group formations and group work

IMPORTANT: This is a face-to-face unit. It is not designed for remote learning.
Echo360 recording is used as a supplement, not as a replacement.

Attendance is not compulsory, but it is highly recommended, (one of the reasons shown on the next slide).



The overall logic (based on strong pedagogical foundations) & your learning trajectory





Expectations & responsibilities

- Your expectations
- My expectations
- Shared responsibilities
- Unit culture and classroom climate
- Underlying philosophy



Assessments

In-term quizzes	20 (10 per quiz)	Weeks 4,7 and 11 (held in lectures)	In person, short quiz (One out of 3 quizzes is optional)	In person
Case study Analysis (Individual)	35	Week 7 (13 April 2025 @ 11.55pm)	AI Industry Case Study Analysis	Via Turnitin
Project: (Team & Individual)	45 (30 for group report and 15 for individual component)	Week 12 (1 June 2025 @ 11.55pm)	Business application of AI	via Turnitin

IMPORTANT: **Different assignments** are offered to BUSA3040 and BUSA6430 students; Due dates are the same;



Code of conduct and integrity

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.



MQ support and tips for success

Student Support

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The Writing Centre

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- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

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- [Subject and Research Guides](#)
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- [IT Support](#)
- [Accessibility and disability support](#) with study

Please see unit guide for a more comprehensive list of student services and support



Part 2: TOPIC 1

- INTRO TO BUSINESS
APPLICATIONS OF AI



Week 1 – Learning Objectives

At the end of this workshop you will develop an understanding of:

- the origins of AI and reflect on its history in relation to the current development in AI
- different definitions and perspectives
- benefits of AI
- challenges and harmful effects
- different types of AI
- AI Risk framework

Very Recent Industry development

The slide features the CSIRO National Artificial Intelligence Centre logo in the top left corner. The main title is "Australian Human Rights Commission". Below it is a quote: "Technology should exist to serve humanity. Whether it does will depend on how it is deployed, by whom and to what end." A small video thumbnail in the bottom right corner shows a person speaking at a podium.

<https://humanrights.gov.au/our-work/technology-and-human-rights>

Technology should exist to serve humanity.
Whether it does will depend on how it is deployed,
by whom and to what end.

Australian Human Rights Commission – Feb 15 2024

Looking ahead: In Week 3 we are going to use the tool presented in this event! 13



AI in Today's world

AI IS TRANSFORMING OUR LIVES IN VISIBLE AND INVISIBLE WAYS

- Have you used AI today/this week?
- Which AI application?
- For what purpose?



Quiz:

What is AI :

- a) software/technology
- b) machine learning, neural networks, intelligent agents
- c) a socio-technical phenomenon that includes technology, people, organisational/business processes, contexts within which AI is used, and AI implications (effects), both intended and unintended
- d) Technology (software, robots, etc.) that can replace people

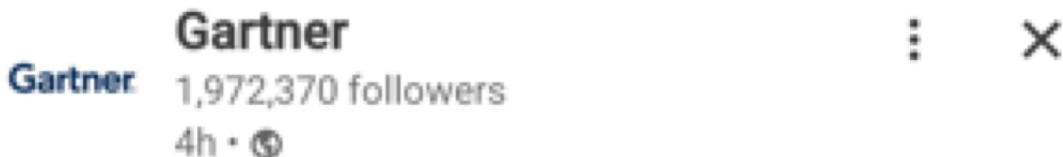
Critical thinking: Why this question matters in practice?

What is going on in the world of business ~~applications of AI~~

Gartner

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New GenAI foundation models are released every two and a half days, yet nearly half of CIOs report that AI hasn't met ROI expectations.

Gartner, Wed 19/2/2025

Critical thinking: Why?



RESEARCH >

Is AI making us dumber? This Microsoft study thinks so

Is AI making us dumber? A new study by Microsoft suggests AI might be turning our brains into mush! Find out the cognitive costs of relying too much on chatbots!

Saturday February 15, 2025 , 4 min Read

Has critical thinking left the chat? Microsoft thinks so!

So you are staring at your screen, trying to remember how to spell 'restaurant' without asking your AI assistant. Sounds bad, right? Well, a recent study by Microsoft and Carnegie Mellon University has spotlighted our growing reliance on AI—and it's got some spicy takes.

The research suggests that leaning too heavily on AI tools might be turning our brains into cosy little couch potatoes, raising eyebrows about the future of our critical thinking skills.



ZDNET

Home / Innovation / Artificial Intelligence

Data scientists: Still the sexiest job - if anyone would just listen to them

Only about one in five machine learning models developed by data scientists make it to actual deployment, survey finds. What's the problem?



By **Joe McKendrick**, Contributing Writer

Feb. 28, 2024 at 12:09 p.m. PT



Important
to
consider



Trust in AI – Australia has the lowest level of trust in AI in the world! (Nov. 2023)



Australia

Australians have broadly ambivalent attitudes about AI, tending to rank alongside Western countries such as Canada, the US and the UK. Australians have the lowest benefit perceptions of all countries surveyed, with only the Japanese expressing less interest in learning more about AI.



AI trust and acceptance



- **34 percent** are willing to trust AI, with **66 percent** unwilling to trust AI or are unsure.
- **55 percent** accept AI, one of the lowest percentages across countries. Only Canada, the Netherlands and Japan rank lower.
- Australians express ambivalent emotions about AI. While **half** (51 percent) are optimistic and **42 percent** are excited, **almost half** are also fearful (49 percent) and worried (47 percent).

Potential AI benefits and risks



- **70 percent** believe AI will deliver a range of benefits. Australians ranked the benefits of AI lower than people in all other countries surveyed.
- **81 percent** are concerned about various AI-related risks, with cybersecurity risk being the top concern (84 percent), followed by job loss due to automation (78 percent).
- **Only 44 percent** think the benefits of AI outweigh the risks.

Who is trusted to develop and govern AI?



- Australians are **most confident** in national universities, international research organizations and defense forces (79-81 percent moderate to high confidence) to develop and govern AI in the public's best interests.
- However, a **significant minority** have no or low confidence in commercial organizations (41 percent) or technology companies (37 percent) to develop and govern AI.

Responsible AI



- **71 percent** believe the impact of AI on society is uncertain and unpredictable.
- **70 percent** report that AI regulation is necessary, with most agreeing that AI should be regulated by government and/or existing regulators or a dedicated AI regulator (both 72 percent).
- **35 percent** feel current regulations, laws and safeguards are sufficient to make AI use safe.
- **95 percent** view the principles and practices of trustworthy AI as important for their trust in AI systems.

AI in the workplace



- **40 percent** are willing to trust AI at work.
- **53 percent** disagree that AI will create more jobs than it will eliminate.
- **39 percent** agree that AI will replace jobs in their work area.

AI IQ



- **59 percent** report a low understanding of AI and when it's being used, with **only 65 percent** indicating they're interested in learning more about AI. This is the second lowest percentage of the countries surveyed; only Japan ranks lower.
- **63 percent** use common applications containing AI, and a similar percentage (57 percent) know that AI is used in those applications.



Some essential questions about AI in business (a sample)

How is AI defined/understood and used in practice?

Who is using AI and for what purpose? What kind of AI?

How is AI integrated with other organisational practices, such as business process management, innovation, performance management, knowledge management, digital transformation, competitive differentiation and new business models?

How to determine the business value of AI?

How to use AI to support ethical & responsible decision making and value creation?



Some essential questions about AI in business (a sample)

How do we operationalise (implement in practice) high-level responsible AI principles and guidelines? How do we choose among so many of them? How do we keep up with so many? Should we even keep up?

What are the unintended consequences of AI for individuals, organisations and/or society at large?

How is your future work going to be impacted by AI? Will my profession become obsolete/replaced by AI?

How do you future-proof your AI (and other) **knowledge and skills** for **the unknown and unknowable future of AI?**

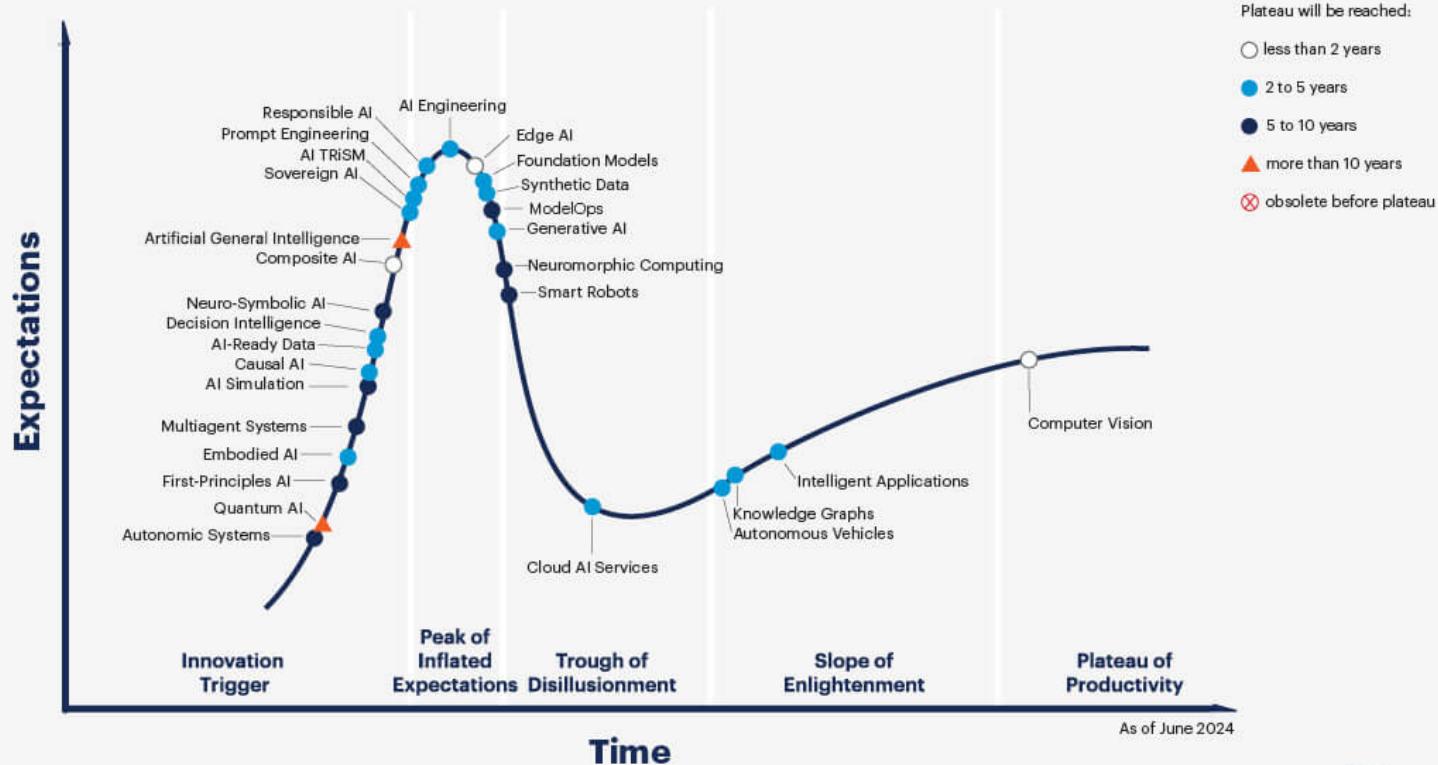
Is education/professional development even needed when I can use Generative AI to get answers to any questions?

What is the future of work, society and humankind in AI-driven word? What is your role in it, as a business/AI or any professional?

Your questions?



Hype Cycle for Artificial Intelligence, 2024



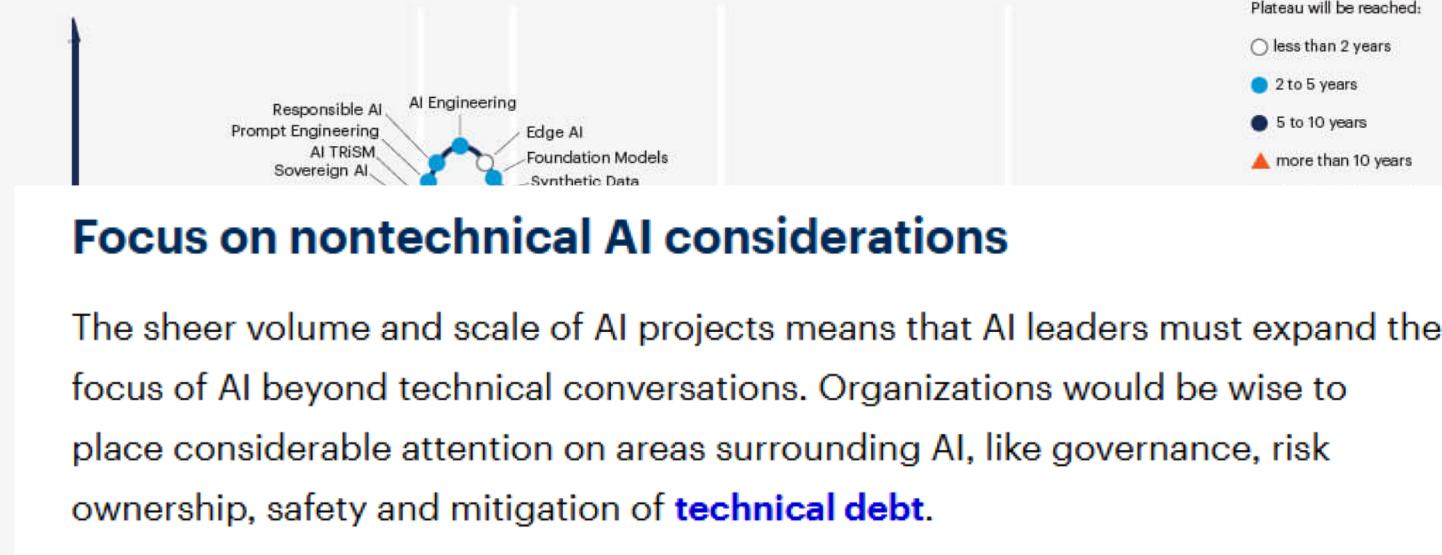
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Gartner

Generative AI (GenAI) receives much of the hype when it comes to artificial intelligence. However, the technology has yet to deliver on its anticipated business value for most organizations.



Hype Cycle for Artificial Intelligence, 2024



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Gartner

Generative AI (GenAI) receives much of the hype when it comes to artificial intelligence. However, the technology has yet to deliver on its anticipated business value for most organizations.



AI in Today's world

BENEFITS OF AI

- Increased efficiency
- Increased productivity
- Improved decision-making
- Better use of employees' skills and talents
- Empowerment of people in workplaces and society
- Creation of new products and services
- Improved safety of humans (in different contexts)
- Improved health and well-being
- New employment opportunities
- &more benefits emerging



AI in Today's world

POSSIBLE HARMFUL (NEGATIVE) EFFECTS

- Job Displacement
- Skill loss
- Privacy & other ethical concerns
- Bias in AI Systems
- Discrimination and denial of service/opportunities
- Security Risks
- Harm caused by 'AI Hallucination'
- Treat to human safety (in various contexts)
- Lack of Explainability
- Human rights issues
- Unregulated responsibilities
- Amplification and propagation of harm across AI systems
- Misinformed beliefs about AI – "AI is neutral", "AI is right"; "AI is THE answer"
- & ...new types of harm are emerging



AI in Today's world

SOME ETHICAL CONCERNS

- **Accountability:** Who is responsible for harm caused by AI?
- **Transparency:** AI as a "black box" problem
- **Fairness:** AI can perpetuate and exacerbate existing and create new ones
- **Privacy:** AI systems often rely on large amounts of personal data
- **Autonomy:** Impact of AI on human autonomy and agency (ability to act)

More on this topic later in the session.



Quiz:

AI was invented:

- a) In 1950s
- b) around 5 years ago
- c) Last year when ChatGPT was made available to the public
- d) around the same time as Machine Learning
- f) This one is here to confuse the robots!



A brief history of AI

The origins of AI:

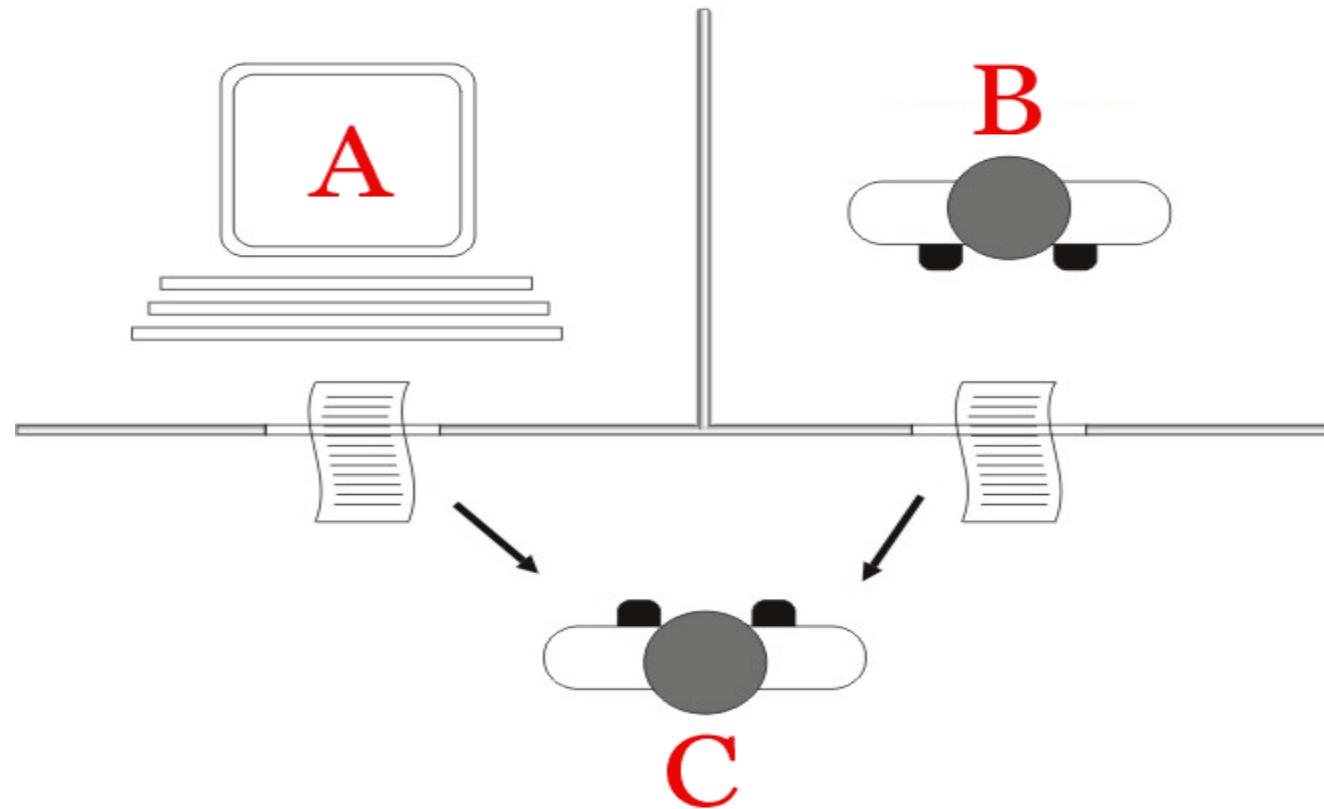
'I propose to consider the question: “Can machines think?”'

A. M. Turing (1950) Computing Machinery and Intelligence. Mind 49: 433-460.

Turing Test: Computer's ability to fool human interrogators that its answers were given by human



Turing test:





A brief history of AI (cont.)

- **1956 – BIRTH OF AI:**
 - Summer conference at Dartmouth, sponsored by the Defense Advanced Research Projects Agency (DARPA)

Herbert A. Simon presented “Logic Theorist” (the first “AI program”) used to prove mathematical theorems from “Principia Mathematica”
- **1954-1974:** Great enthusiasm
 - Well-funded research to fulfil the promise of developing “AI systems equivalent of human brain”
 - **Notable developments:** ELIZA (a predecessor of today’s chatbots)



Let's look at ELIZA

Context: Psychotherapy – Human as patient

Human: Well, my boyfriend made me come here.

ELIZA: Your boyfriend made you come here?

Human: He says I'm depressed much of the time.

ELIZA: I am sorry to hear you are depressed.

Human: It's true. I'm unhappy.

ELIZA: Do you think coming here will help you not to be unhappy?

Question: Can you see a pattern here?



A brief history of AI (cont.)

- **1974 – 1980:** The first “AI winter” – The original promise turned out to be highly unrealistic

Notable developments:

- Expert Systems
- More efforts focused on commercial AI product

- **1980 – 1987:** Renewed enthusiasm

Notable developments:

- (A form) of the First Neural Network (4 nodes)

*“... very limited success in particular areas, followed immediately by failure to reach the broader goal at which these initial successes seem at first to hint...”.
(DARPA Information Science and Technology Office)*



A brief history of AI (cont.)

- **1980 – 1987** – Renewed enthusiasm:

“... very limited success in particular areas, followed immediately by failure to reach the broader goal at which these initial successes seem at first to hint....”. (DARPA Information Science and Technology Office)

- **Early 1990s – to early 2000s:** Second AI winter

- “[Investors] were put off by the term 'voice recognition' which, like 'artificial intelligence', is associated with systems that have all too often failed to live up to their promises” – The Economist, 7 June 2027
- "At its low point, some computer scientists and software engineers avoided the term artificial intelligence for fear of being viewed as wild-eyed dreamers.“ – NY Times 2005

Notable developments: Machine Learning applications

- **11 May 1997:** Major development

- Deep Blue beat the world chess champion Garry Kasparov
- 2005 – Stanford robot drives autonomously 131 miles across a desert road and wins DARPA Grand Challenge



A brief history of AI (cont.)

- **2005 – 2020** AI behind the scene
 - Rise of deep learning and big data/analytics
 - AI-based applications: data mining, Google search engine, recommender systems, big data systems
 - AI promoted as the next generation of big data analytics
 - **Notable development:**
2017 -Transformer architecture proposed by Google (enabling Large Language Models)
- **2020 – Today** AI Era (a.k.a. AI Summer)
 - Rapid development of Large Language Models
 - OpenAI released – GPT-3 (Generative Pre-Trained Transformer-3) in 2020 (transformer model of deep neural network)
 - **Notable development:**
 - 11/6/2020 – OpenAI announces that users can request access to its GPT-API to road-test the tool
 - 18/11/2021 OpenAI announces that enough safeguards have “been implemented” to give unrestricted access to its API
 - 27/4/2023 – OpenAI makes GPT-3.5 with Browsing publicly available

Let's Pause and Reflect: What did you observe?



Informal history: Isaac Asimov's “Three Laws of Robotics”

Often mentioned in AI Robotics, even though it was proposed in a Sci-Fi book

Isaac Asimov's "Three Laws of Robotics"

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Interesting turn of events...



The first national-level AI ‘soft law’ – UK Gov 2011

1. Robots are multi-use tools. Robots should not be designed solely or primarily to kill or harm humans, except in the interests of national security.

2. Humans, not Robots, are responsible agents. Robots should be designed and operated as far as practicable to comply with existing laws, fundamental rights and freedoms, including privacy.

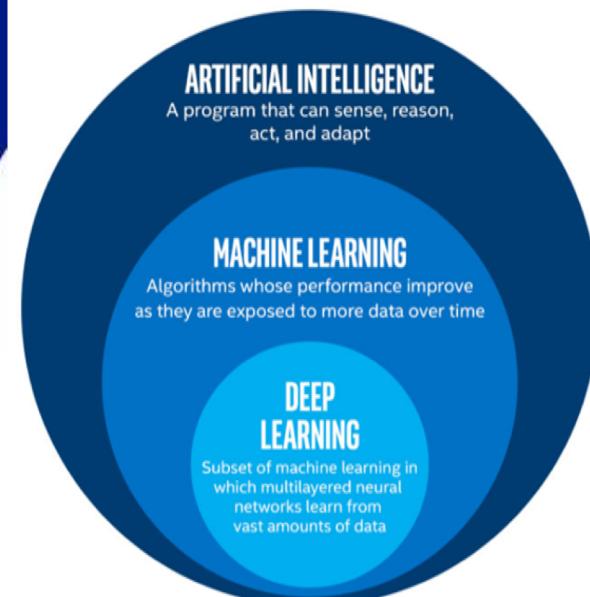
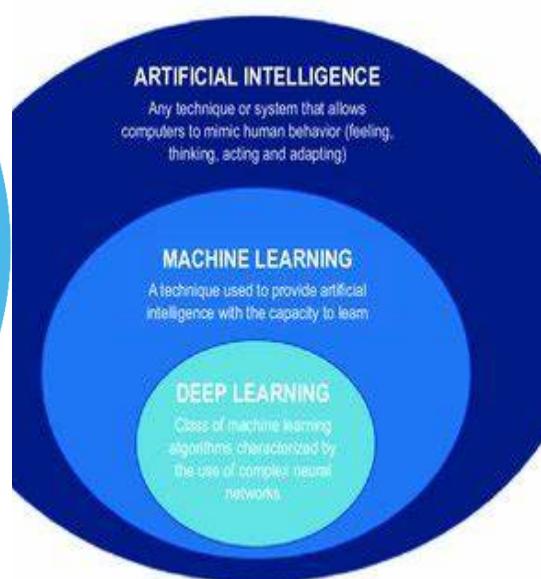
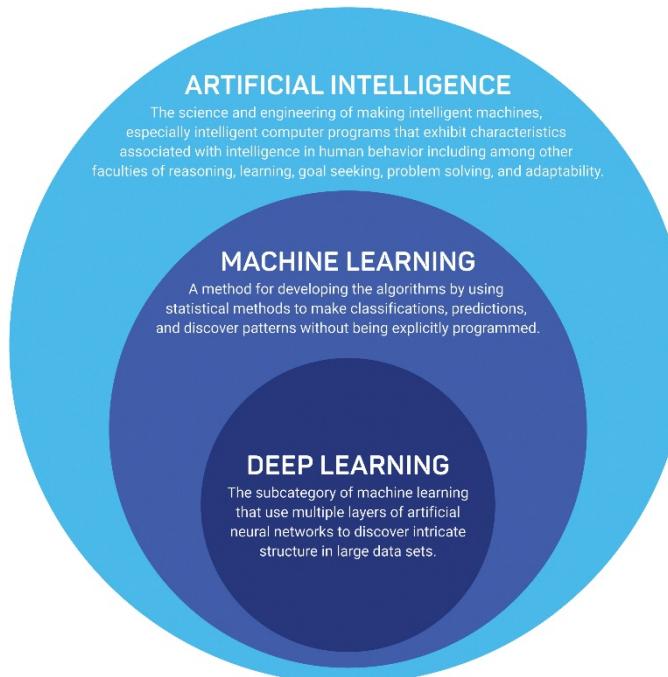
3. Robots are products. They should be designed using processes which assure their safety and security.

4. Robots are manufactured artefacts. They should not be designed in a deceptive way to exploit vulnerable users; instead their machine nature should be transparent.

5. The person with legal responsibility for a robot should be attributed.

Source: UK Government (2011): Engineering and Physical Sciences Research Council

Observe different definitions and interpretations





Technical definitions of AI

- “AI is defined as the simulation of human intelligence processes by machines, especially computer systems”
- “AI is a field that combines computer science and robust datasets to enable problem-solving”
-
- “AI refers to applying advanced analysis and logic-based techniques, including machine learning (ML), to interpret events, support and automate decisions, and take actions”

Socio-Technical Definitions of AI

- AI is seen as a **socio-technical system**, i.e., the combination of the technical component (i.e., the code and—if used—the data) and socio elements (i.e., the stakeholders responsible for the system and the society in which the system is deployed)



The importance of socio-technical view of AI



Response to NIST RFI on AI Executive Order 14110:

The Importance of a Socio-technical Approach in AI Development

Submitted by the Institute for Trustworthy AI in Law and Society

February 2, 2024

....because Generative AI is a Socio-
Technical System After All

Medium

Jan 12, 2024



However...

May 29, 2024

Around the Institute

Why We Need a Sociotechnical Approach to AI Policy

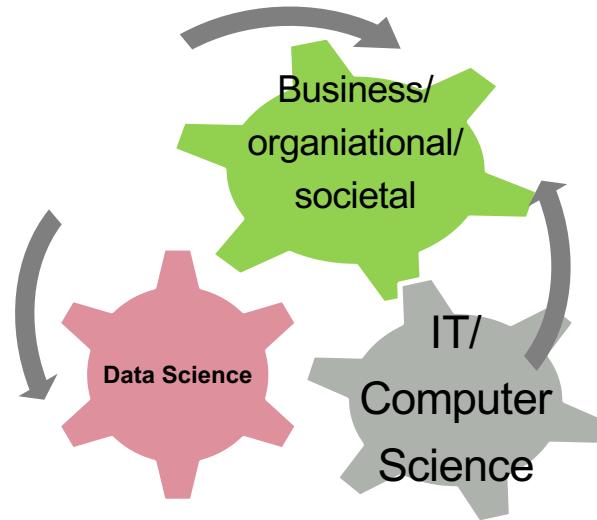
Despite its increasing adoption in AI governance and industry circles, the term “sociotechnical” is deeply misunderstood. Drawing on established

The term
‘sociotechnical’
is deeply
misunderstood



You will learn
about the socio-
technical
view/approach
to AI in Week 2.

Let us clarify different perspectives of AI



IMPORTANT: In this unit we are focusing on the Business/organisational perspective, which also considers societal impact (as per socio-technical approach)



Activity: Let us pause and reflect

- Why do different perspectives matter in practice
- Why is it important to recognise the perspective taken in definitions and organizational and societal applications of AI



Classification of AI: Narrow (Weak) AI

- Limited to a specific (narrow) area
- Designed to mimic/simulate human intelligence
- Popular examples:
 - Digital Voice Assistants: Siri, Alexa, and Google Assistant (respond to voice commands, perform simple tasks like setting alarms, making phone calls, and answering questions)
 - Recommendation Systems: Used by platforms like Netflix, Amazon, and Spotify
 - Chatbots: Chat-based applications
 - Autonomous Vehicles: AI-operated vehicle without human involvement



Classification of AI: Strong (General*) AI

- At this point in time (in Feb 2025) General AI is **still** a theoretical concept
- Based on the theory of mind AI framework
- AI not just mimicking (simulating) human intelligence but able learn human behavior and understand the fundamental aspects of consciousness.
- General AI having ability to plan, learn, self-teach, make judgments, handle uncertain situations, and integrate prior knowledge in decision making to make better and better decisions and self-improve performance
- General AI is envisaged to perform innovative, imaginative, and creative tasks
- *NOT to be confused with Generative AI

Classification of AI: Super Strong (Theoretical AI)

- At this point in time (in Feb 2025) considered to be a frontier of AI
- AI that is conscious, feeling and self-aware

PAUSE and Reflect: Remember the history of AI?



A framework for AI risk assessment

JAN 2024

"Governments in 78 countries across six continents have worked with research scientists and others to develop draft legislation aimed at making AI safe, though **the work is still evolving**" – MIT press <https://mitsloan.mit.edu/ideas-made-to-matter/a-framework-assessing-ai-risk>

- **Low risk: Green-light use cases:**

- AI applications without potential for harm; have been used for many years (e.g. product recommendations, customer-chatbots etc.)

- **High-risk: Yellow-light use cases:**

- AI applications that impact on different aspects of human lives and have a potential to create any harm (note: 'Any' harm; There is no such a thing as "little bit of harm") – many business applications are in this category
 - Require human oversight; implement monitoring; continuous testing

- **Prohibited*/Very high risk: Red-light use cases:**

- AI applications that **should** be prohibited (e.g. social scoring, public surveillance)

Heads up: In Week 1 tutorial you will investigate and classify different applications of AI using this framework; we will also investigate if some of examples could be classified differently in different contexts)



Week 1 - Overview

- **What we covered:**
 - History of AI
 - Gartner's hype cycle of AI
 - Definitions and their underlying assumptions about AI
 - Different AI perspectives
 - AI in today's world – benefits and harmful (negative) effects
 - AI Risk framework

- **Key frameworks covered in Week 1**
 - Three different perspectives of AI: Business, IT/CS and Data Science
 - Risk framework: (Low/High/Very High) Risk AI applications
 - Narrow(weak) and General AI



To do list for Week 2

- Find examples of low, high-risk and very-high risk AI applications and bring them to the class

Coming up in Week 2: AI in Business/Organisational context, including more on the socio-technical perspective of AI.