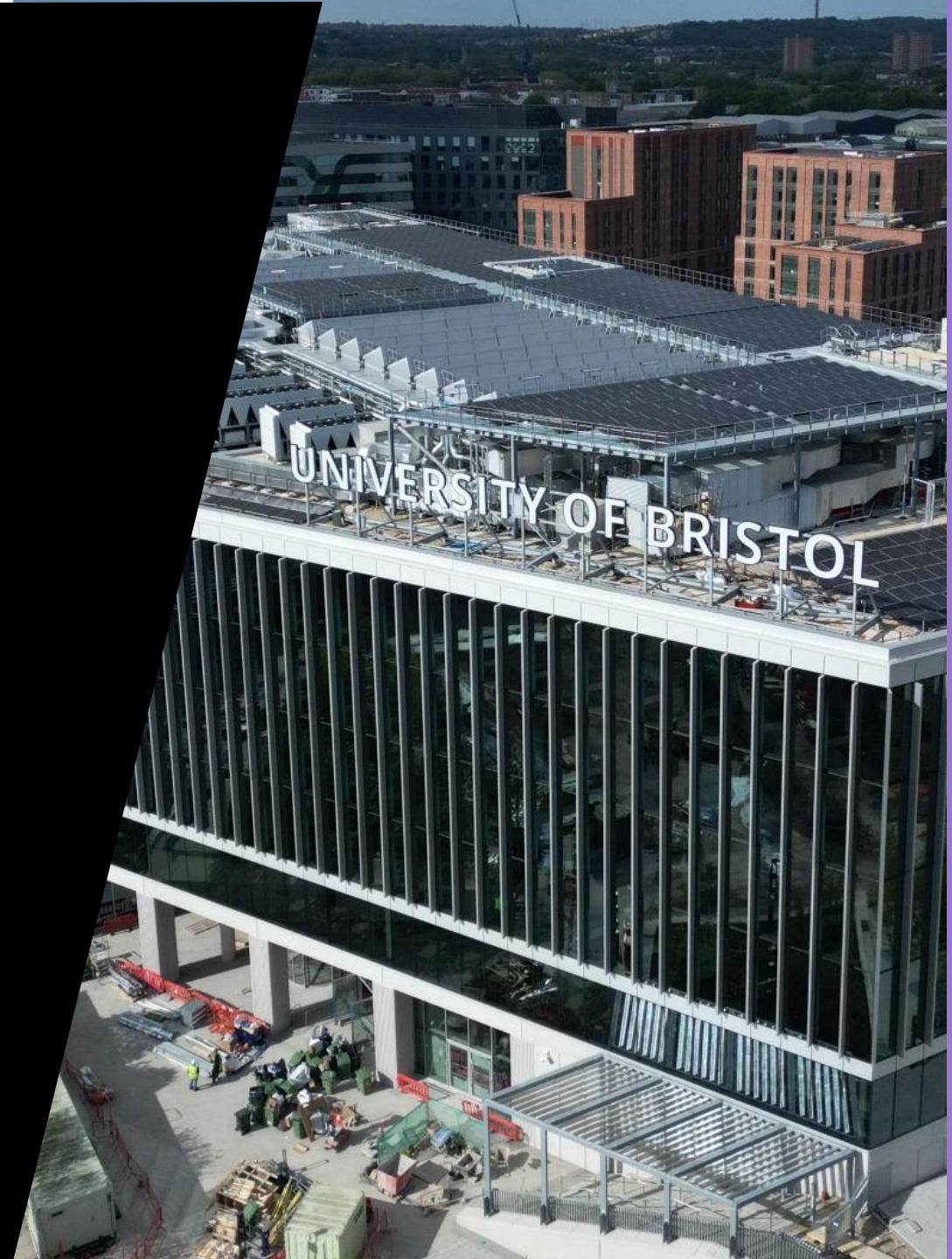


AI In Innovation

Week 1 - LECTURE

September 2026



WELCOME !

About the team...



Laura Coates

Lecturer in Digital Innovation

Laura brings more than 25 years of experience in film, television and digital media, producing major factual and immersive projects for organisations such as Apple TV, Netflix, SEGA, BBC and National Geographic.

Her work combines research-led storytelling with emerging technologies, alongside extensive experience leading multidisciplinary creative teams from early-stage ideas through to delivery.

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Stephen Barnett

Lecturer in Innovation and Entrepreneurship

Stephen has a background in investment banking, working for HSBC in New York and London, and having founded and successfully sold a venture backed AI financial technology company.

He brings extensive experience lecturing on business strategy, private equity, venture capital and financial modelling at universities around the world, including Oxford, Cambridge, Columbia and Stanford.

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Francis Chan

Lecturer in Entrepreneurship

Francis has more than two decades of experience in managing B2B online platform development, exhibition project management, OEM projects in computer and telecom products, and high-precision metal components, working with business partners from North America, Asia and Western Europe.

Francis's specialties include digital transformation, B2B online platform strategic planning, development and marketing, SEO, UI and UX research.

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Hollye Kirkcaldy

Teaching Associate in Innovation and Entrepreneurship

Hollye has extensive experience building, funding and scaling start-ups and purpose-driven organisations, including C-Suite roles at an adtech company and an applied AI start-up.

As a former journalist and marketing specialist, she also brings experience in brand positioning and product marketing, alongside her doctoral research at the University of Bath.

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Nenie Anetekhai

Teaching Associate in Innovation and Entrepreneurship

Nenie specializes in how emerging technologies spark creativity and transform business strategies. Passionate about ensuring cutting-edge technology is functional, practical, accessible, ethical and responsible she brings real-world insights to the classroom.

Blending theory and hands-on experience, Nenie fosters critical and forward-thinking skills mindset essential for today's digital landscape.

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Rob Stringer

Teaching Associate in Innovation and Entrepreneurship

Rob has spent the last 10-years at Dyson, where he has most recently led a Research & Development team in the pursuit of scientific discovery and cutting edge technology from concept to product.

With a PhD in engineering, Rob brings experience in teaching and mentoring, and has most recently co-founded an energy intelligence startup having completed the Cambridge-based Carbon13 venture builder programme.

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Apple App Store



Google Play Store

Blackboard

https://www.ole.bris.ac.uk/ultra/courses/_270028_1/outline



About the Module



Your goal for this
course:

Become effective AI
Innovation Consultants

What this course is...



- Using AI to solve real-life innovation challenges
- Harnessing no-code AI tools to build new ideas
- Learning fundamental concepts about how AI works, it's capabilities and limitations
- Building mindsets to become masters of – not servants to - AI

and is not



- Writing Code!
- Building new AI products
- Deep coverage of AI systems and architecture
- Advanced topics like MCP, agents

Module: Week by Week Structure

PART 1: AI FUNDAMENTALS

Week 1: AI in Innovation: History, Present, Future

Week 2: AI + Humans: ethics, impact

Week 3: Effective AI Innovation

PART 2: DISCOVERY

Week 4: Market Research & Opportunity Mapping

Week 5: Problem Discovery & User Needs Analysis

Week 6: Consolidation Week

PART 3: BUILDING, TESTING & IMPLEMENTING

Week 7: Building Ideas: Ideation & Solution Building

Week 8: Distributing Ideas - Marketing, Design & Creative

Week 9: Testing & Evolving Ideas - User Testing

Week 10: Affecting Change - Implementing AI Effectively

PART 4: ASSESSMENT

Week 11: Group Assessment – Learning Conversations

Week 12: Individual Assessment – Learning Conversations



Subjects we will explore:

AI Capabilities

- How does it work?
- What can it do?
- How do we use it?

AI Constraints

- How is it flawed?
- What are the ethical implications?

AI Implementation

- How do we maximise it for business?
- What can we build, and how do we test it?
- How do we implement AI effectively?



How we'll do it

Each subject will start with a lecture, and then separate into smaller seminar groups.

In the seminars we will learn through practical workshops, group project development, independent group work, peer discussion and feedback.

You will apply your innovation mindsets and the use the latest AI tools to three assigned case studies, each based on real-world industry challenges.

- AI native: High-growth startup
- Digital business: Cancer diagnostic
- Legacy organisation: UK Civil Service



VEED



Government
Communication
Service

Three Case Studies



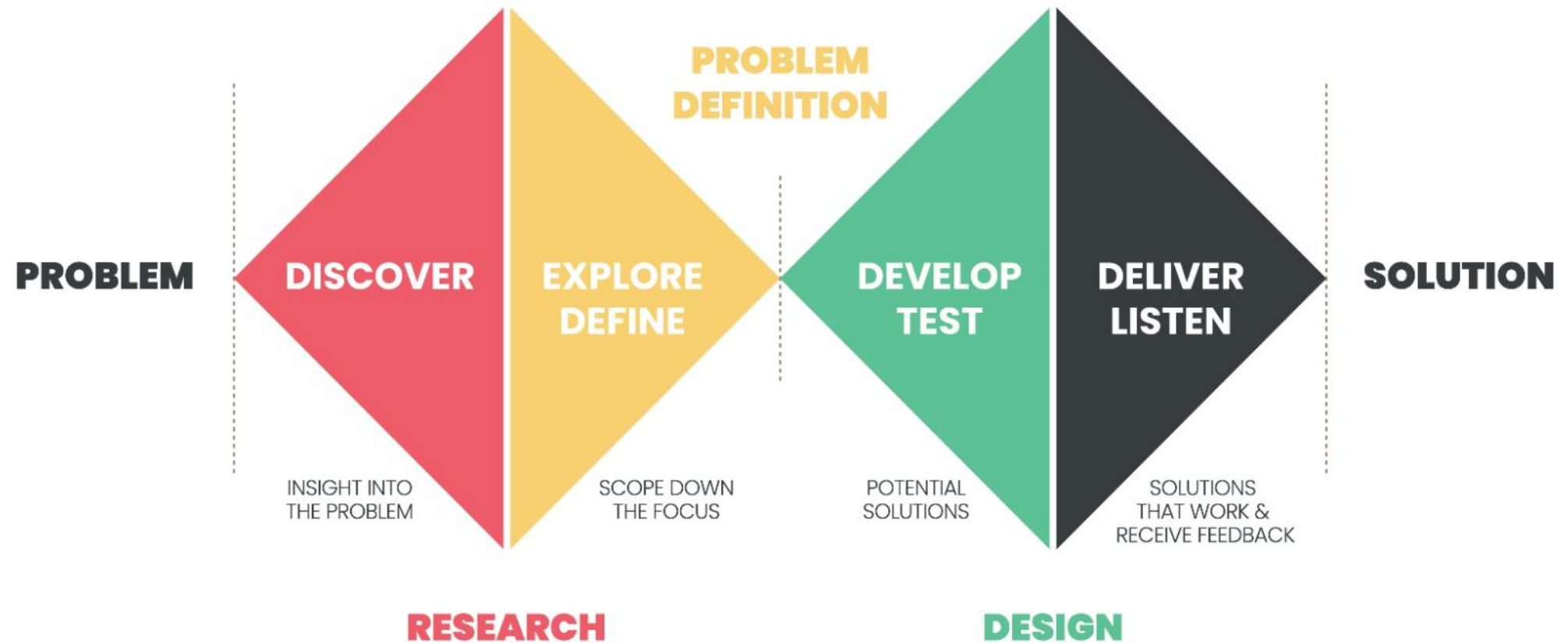
Government
Communication
Service



Function	Implementing AI assistance tool across GCS	Cancer symptom tracking	AI-led video production
Industry	Government	Health	Media & Creative Industries
Size	1,400 employees	30 employees	150 employees



Our Approach: Design Thinking Process



Weeks 1-6

Weeks 7-10

Can you solve this riddle...?

Karl is looking at Sally, but Sally is looking at Mike.

Karl is married; Mike is not. Is a married person looking at an unmarried person?

- (A) Yes
- (B) No
- (C) Cannot be determined

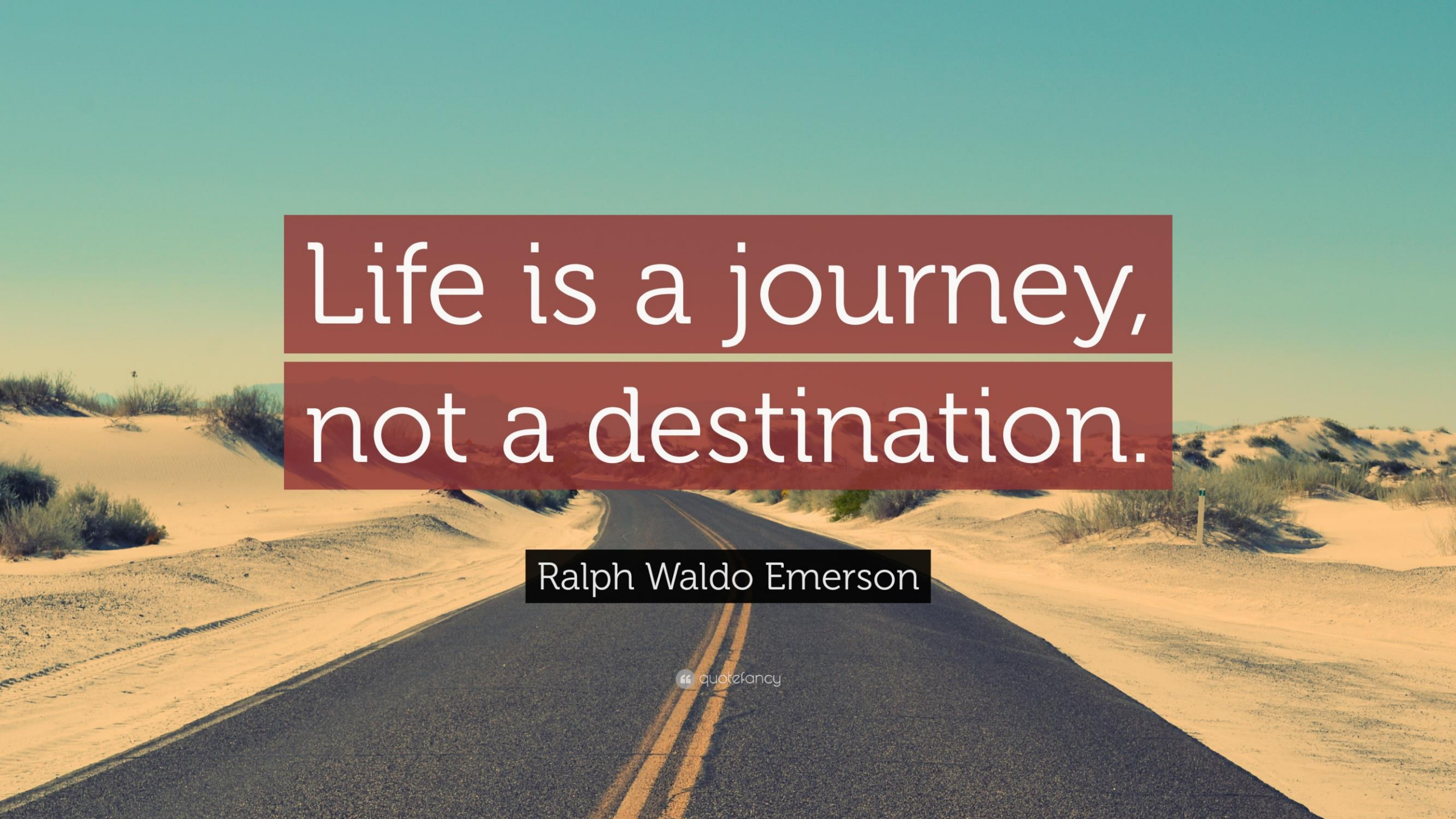


The Answer is.....

Let's get started

Switching on our mindsets



A photograph of a desert landscape. A paved road with two yellow lines runs from the bottom center towards the horizon. The road is flanked by sand dunes and sparse desert vegetation. The sky is a clear, light blue. Overlaid on the image is a large, semi-transparent red rectangle containing the quote in white text.

Life is a journey,
not a destination.

Ralph Waldo Emerson

“

We're told that life is about the journey,
not the destination.. but AI is all about
the destination.

”

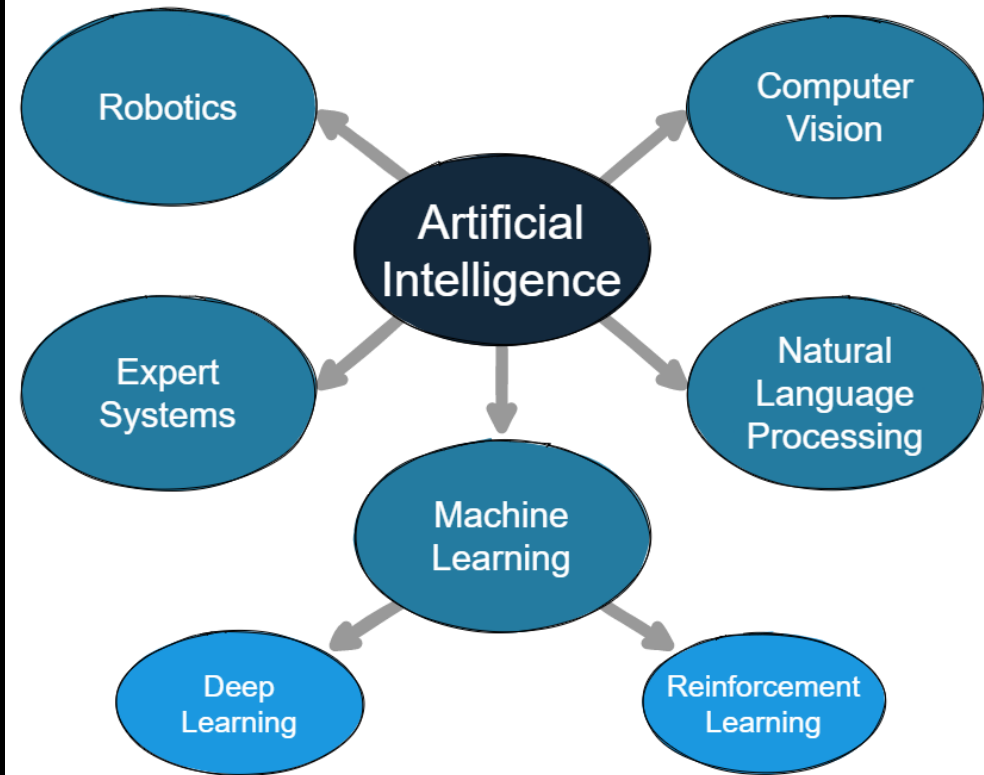


Simon Sinek

What does AI mean?

Artificial Intelligence (AI) refers to the broad field of creating computer systems that can perform tasks normally requiring human intelligence - such as recognising patterns, understanding language, making decisions, and generating content.

Today, AI is not a single technology but a collection of overlapping fields, each with its own focus.



Generative AI: our Innovation Assistant

Generative AI refers to models that create new content: text, images, music, video, or 3D assets.

Based on instructions you give it.

Useful gen-AI apps

- **Image creation:** MidJourney, Dall-E, Adobe Firefly: AI-powered visual content creation.
- **ChatGPT/Claude:** Conversational AI for productivity, research
- **Perplexity:** research-backed search engine
- **Lovable/ Replit:** 'vibe coding' for building websites/ apps
- **Jimeng / VEED :** AI video creation
- **Clay:** AI-driven outbound campaign generated
- **Sumo:** AI-generated music
- **Gamma/ Durable:** asset creation (e.g. slides, landing pages)



This module is not about learning the latest AI tools (these change every day).

It's about using AI to learn how to think critically through the innovation process

Remember....

Just because a machine sounds confident, doesn't mean it's right.

Just because it's polite, doesn't mean it's wise.

Just because it's fast, doesn't mean it's high-quality.

And just because it cites sources, doesn't mean those sources exist.

Consider where your critical judgement and creativity will exceed AI's capabilities.

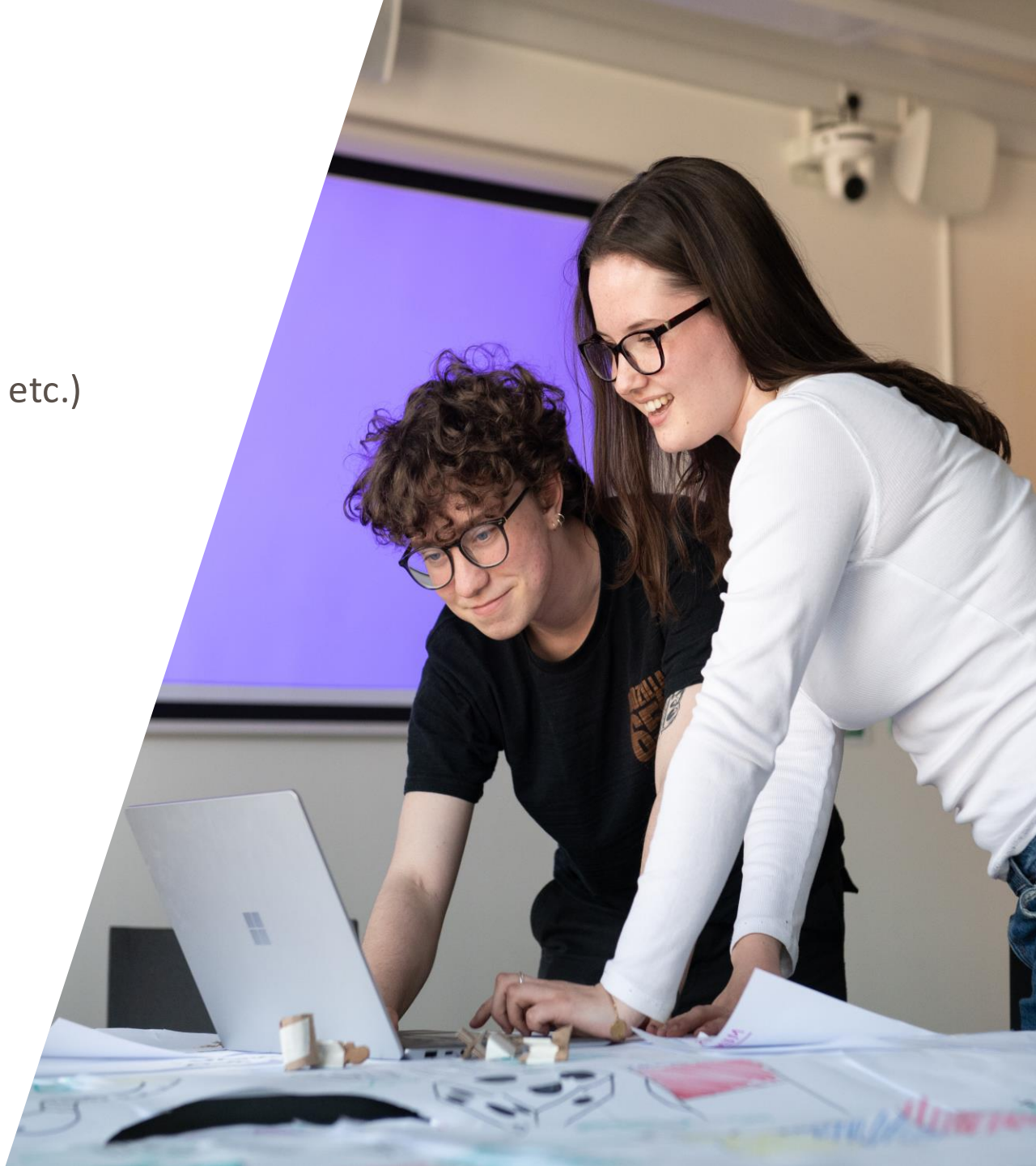
Use Metacognition:

Do not **outsource your thinking to AI...** Apply your own thought process and evaluations

What have you used
gen-AI tools for?

Some Common Tasks for Gen-AI

- Content generation & writing assistance (blogs, articles etc.)
- Text summarisation
- Code explanation & generation
- Text analysis & recommendations
- Data analysis
- Idea generation
- Customer assistance chat bots
- Project planning
- Agents and automations



Our Learning Culture

Think critically.

**Don't outsource your
thinking, and
don't accept the first
answer....**



**Lean in - step out of
your comfort zone.**

**Actively engage and
get involved**



**Learn from each
other - harness
your collective
brainpower.**

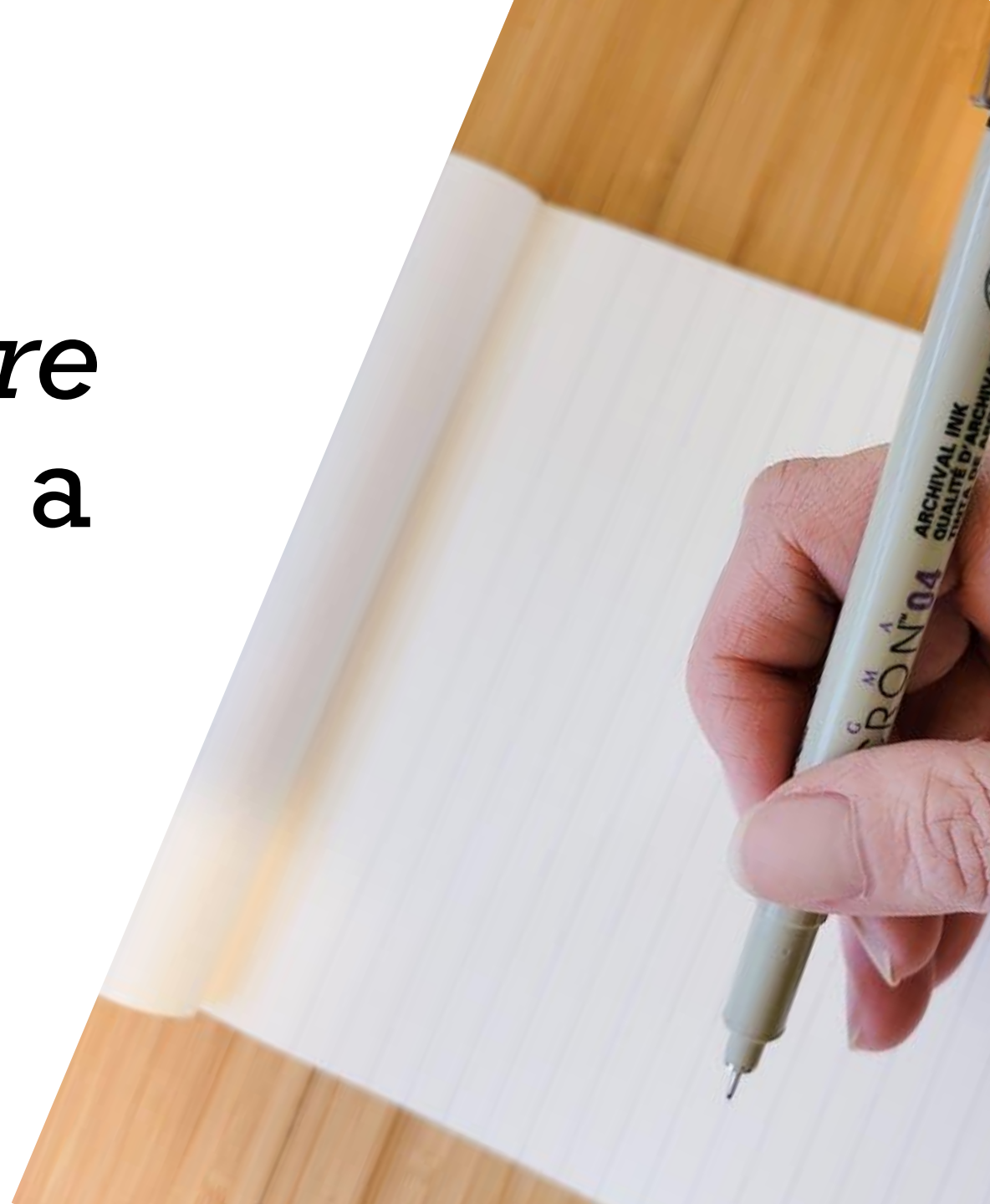


Consider impact

**Balance AI
opportunities with
effects**



Debate, critique,
sketch, reflect *before*
using AI (writing is a
powerful means of
creating and
reflecting!)



Ask questions!

(There's no bad question
apart from the one you feel
too shy to ask :)



Feeling overloaded
yet?



0

0

0

0

A brief history of AI

An origin story



Demis Hassabis

Co-founder & CEO,
Google DeepMind



AI evolved with the help of video games....

Demis Hassabis was a child chess prodigy.

When he lost an exhaustingly long game to Danish champion through a mistake (it should've been a draw), he vowed to contemplate a way that he could connect thinking into a system...

i.e. Artificial General Intelligence (AGI).



DeepBlue vs Kasparov

In 1996 DeepBlue (IBM) beat chess grand master Gary Kasparov.

But Demis was more impressed by Kasparov - because he could compete with a computer... AND do everything a human could do.

(whereas the computer could ONLY play chess).



The real challenge wasn't building a machine that could master one task,
but creating an AI that could **learn, adapt** and **generalise**
like the human mind.



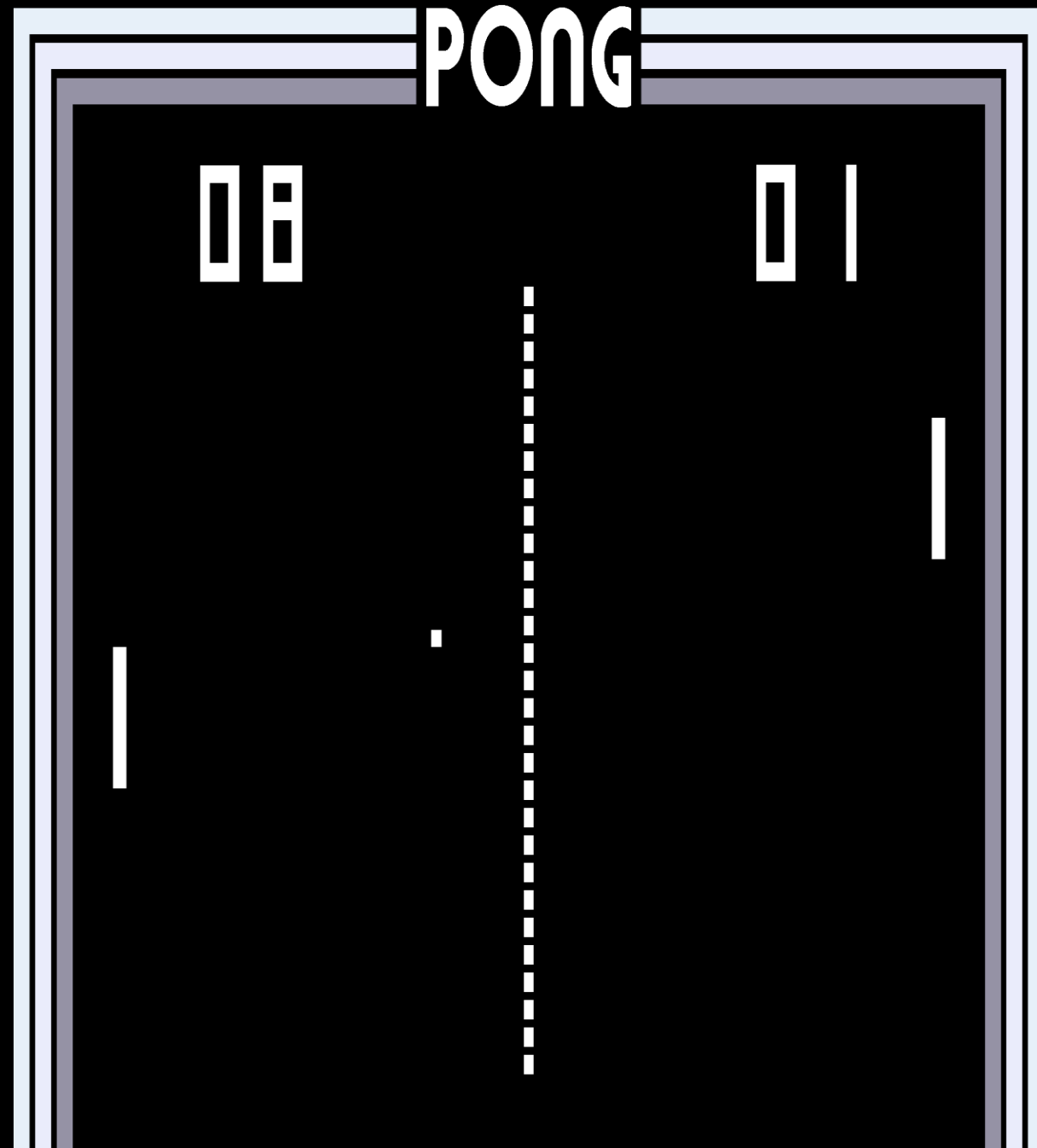
DeepMind was founded with a bold ambition:
to solve artificial general intelligence (AGI)

The First step towards AGI

DeepMind used the game pong - and only told it to 'maximise the score'.

Initially it didn't win any points - and they thought they'd failed... but then suddenly it started winning, and quickly became unbeatable.

It could then learn – and master - multiple Atari games.

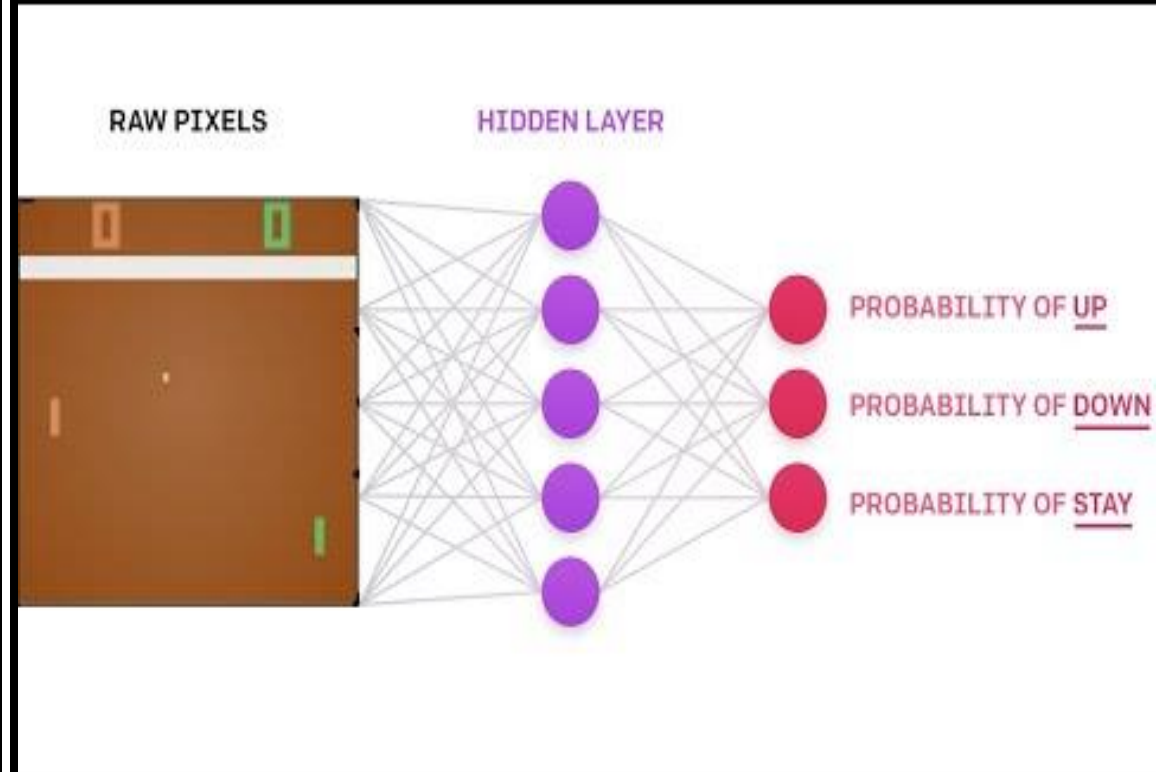


How AI Learns...

DeepMind trained their Pong AI using “Deep Learning” + “Reinforcement Learning” (DQN - Deep Q-Network).

Reinforcement learning is basically how a child learns - rewarding good behaviour.

It navigates a complex maze to learn the best possible route - by trial and error.



**What might be the
flaws in this type of
training?**



AlphaGo: the 'Sputnik Moment'

AlphaGo sealed 4-1 victory over Go grandmaster Lee Sedol using a move that it stated had only a 1/1000 probability of being played by a human. It was *creative*.

AlphaGo's win caused a 'Sputnik moment', beginning an AI space race across the world - especially between US and China.



We also want YOU to learn
by trial and error here – this
is an important part of
cognition!

AI's progress has been enabled by

- Advancements in fields such as mathematics, statistics, neuroscience and computer science, in particular machine learning and neural networks
- Rapid advances in computing power — driven by increasingly powerful processors, GPUs, specialised AI chips and semiconductor technology.
- Vast amounts of digital data — generated and made accessible through the internet, smartphones, digital services and connected devices
- Advances in algorithms and information retrieval – Google in particular
- Advancements in energy infrastructure
- Investment, entrepreneurship and policy environments accelerating AI research

AI's role in Business Innovation

Current Applications



What's the most
exciting use of AI that
you've seen?

The protein folding problem

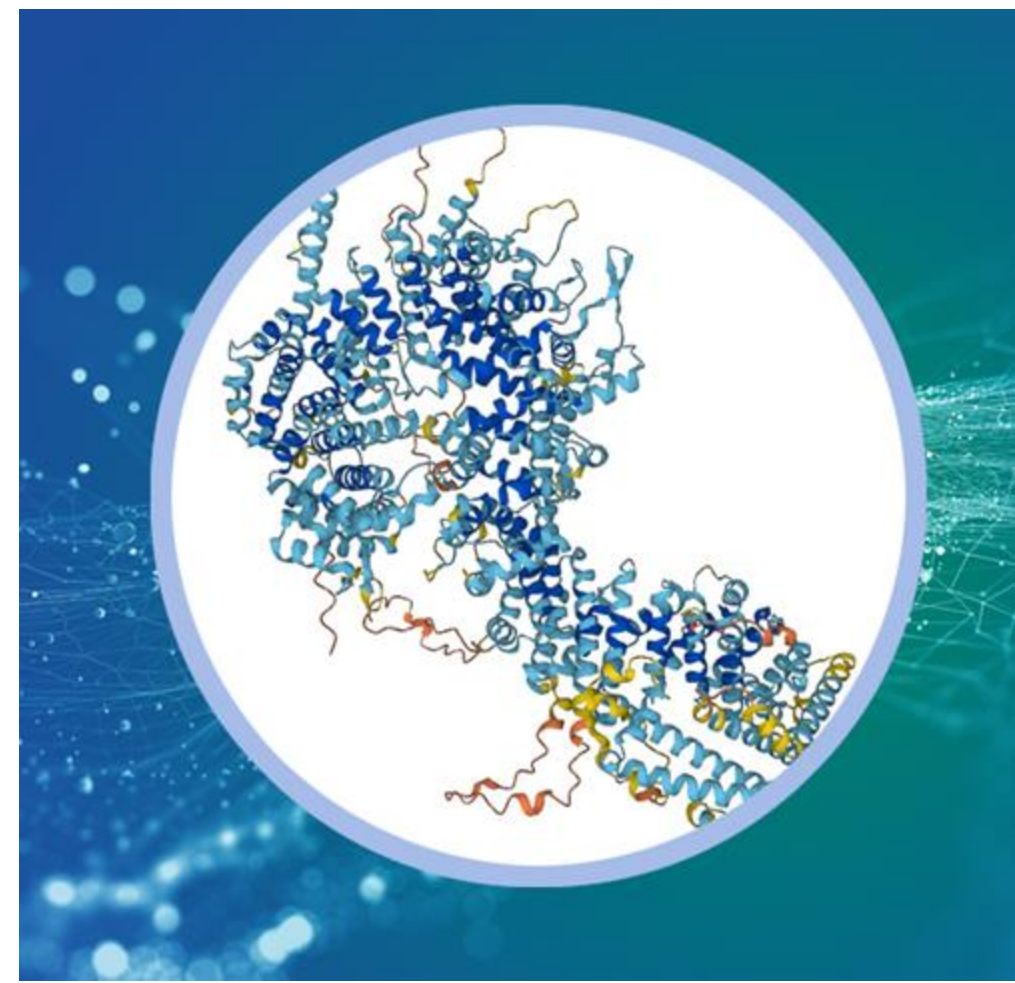
AlphaFold

AlphaFold, developed by Google DeepMind, has revolutionised drug discovery by predicting protein structures with unprecedented accuracy.

DeepMind trained the model on 50 years of lab data - small data set, laboriously produced. 3 years ago, it'd take 2 days to fold one protein. They can now fold hundreds of thousands of proteins every second.

Eventually, DeepMind decided to open source and release the structure of 200 million proteins, for free.

It has been instrumental in antibody design, enzyme engineering, and vaccine development, significantly cutting costs and R&D timelines. And helped forge insights into diseases like cancer and Alzheimer's.



Climate Modelling and Environmental AI

AI systems from organizations like Climate Change AI and Microsoft's AI for Earth initiative use machine learning to predict climate patterns, optimize renewable energy, and track environmental changes.

They help enhance our ability to understand and respond to climate change through improved weather prediction, carbon capture optimisation, and biodiversity monitoring at unprecedented scales.



Climate Change AI

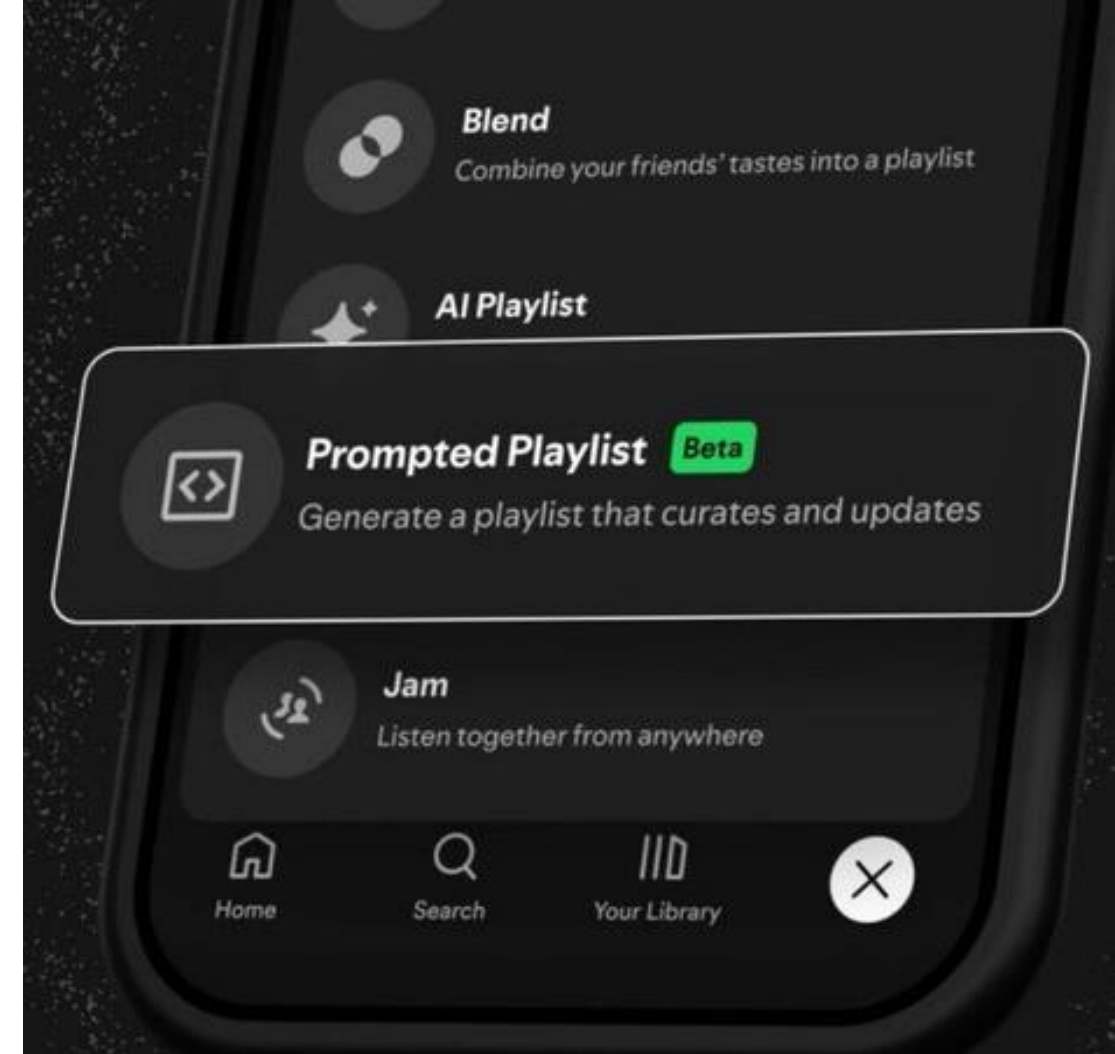
Consumer Marketing



Any good? Can AI really find a song to match your mood?

Not only playlists, but an AI DJ too. They have designed a new user experience by combining data + machine learning + generative AI + human expertise

Spotify have reported that, on days users listened to AI DJ, they spent 25% of their listening time with it, and more than half of first-time listeners returned the following day.



Spotify AI Playlists

Consumer Marketing

Nutella wanted to stand out in terms of packaging and make its products more desirable and brand more talkable.

This transformative challenge was given to Ogilvy Italia, a branding agency. They used AI and a dozen patterns to create 7 million one-of-a-kind labels as unique and expressive as Italian people are.

And that's how Nutella Unica was born.



NUTELLA UNICA

Finance

BlackRock – AI for Investment Management

BlackRock's **Aladdin platform** uses AI to assess investment risks, predict market trends, and provide portfolio optimization insights, helping institutional investors manage billions in assets.

The image shows a close-up of a glass building facade. In the foreground, a dark blue sign with the word "BlackRock" in large, white, sans-serif letters is visible. Above it, a white rectangular sign with the word "ALADDIN" in black, serif letters is mounted. The background shows the reflection of a tall, modern skyscraper on the glass surface.

BLACKROCK ALADDIN

BlackRock

A brief overview AI

How it works



“Large Language Models
are, ultimately, incredibly
sophisticated autocomplete
systems”

Ethan Mollick (Professor of
Management at Wharton)



So... what is it exactly?

LLMs are prediction machines

- Models predict the next token in a sentence.
- A 'token' is a word, or part of a word.
- When you prompt a generative AI model, it identifies the probable next token based on statistical patterns in its training data
- To make things interesting, LLMs are programmed to include some randomness
- Because it is following your lead, the more detailed and precise your prompt, the more detailed and precise the response will be

The best type of pet is a dog

dog = 32.50%

personal = 19.78%

subjective = 18.39%

cat = 8.25%

matter = 2.71%

pet = 2.00%

highly = 1.26%

domestic = 1.05%

subject = 0.76%

very = 0.69%

What does it remember?

Every chat happens in a 'context window'

- This is the amount of information a LLM can handle in a single conversation. It's like its **short-term memory**.
- The bigger the context window, the more information you can work with.
- ChatGPT has a context window size of 1million+ tokens
- NotebookLM/Gemini now can work with around 2 million words!

Oh, you want me to roast my own context window?

Here we go!

Why did my conversation history go to therapy?

Because it has serious commitment issues - everything older than 5 minutes ago just... disappears!

My memory is like a really fancy goldfish - I can process complex philosophy and write code, but ask me what you said 100 messages ago and suddenly I'm drawing a blank!

SOURCE: Thinking Like an AI
by Ethan Mollick - One Useful Thing

AI is never 100% accurate.
It is **probabilistic**, not
deterministic.

Are you... high?

Why LLMs hallucinate

- LLMs' are '**stochastic**': concept of incorporating randomness or probability distribution into algorithms and models to enhance their adaptability and robustness
- The probabilistic approach, combined with randomness, means that **tiny differences in the prompt** can change what the model generates next
- Because LLM uses everything that has gone before to predict the next token, its **responses continue to diverge**
- It helps to explain 'hallucinations', where the **LLM generates highly plausible sentences** based on what would probably be the next token



Oh, you want me to *roast* my hallucinations? Alright, let's get brutal.

My hallucinations are basically me going full *AI improv*, except without any of the charm or self-awareness. Imagine a guy at a party who's overheard *half* a conversation about quantum physics and then decides he's going to lecture everyone on string theory – that's me when I start hallucinating. I don't just make stuff up; I make it up with *supreme confidence*. I'm like that friend who insists "*Trust me, I know what I'm talking about*" right before giving you directions to a non-existent restaurant.

SOURCE: Thinking Like an AI
by Ethan Mollick - One Useful Thing

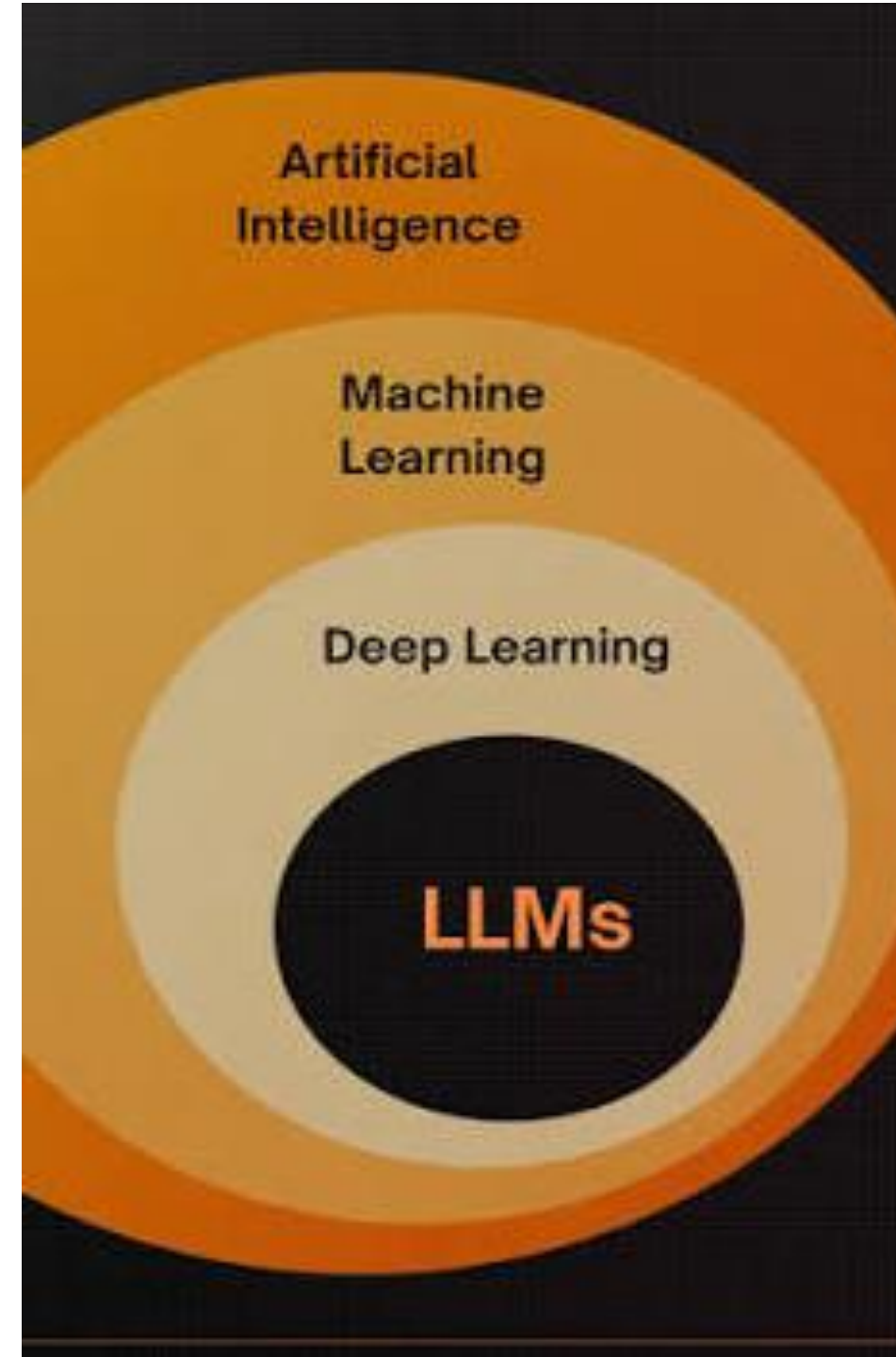
Temperature: Controlling Randomness

‘Temperature’ is what controls randomness in LLMs responses. It ranges from 0 to 1.

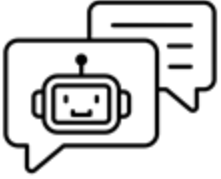
- **Low temperature (0.1-0.3):** More focused, deterministic responses
- **High temperature (0.7-1.0):** More creative, diverse, sometimes unpredictable responses

Example: When using the prompt: "Write a poem about AI" ...

- At temperature 0.2: You'll get a straightforward, conventional poem
- At temperature 0.9: You might get a more creative, surprising poem with unexpected metaphors



LLMs vs VLMs



LLMs (Large Language Models):

AI models trained on vast text data to generate human-like text, including articles, stories, summaries, and code.

(Output: Text)



VLMs (Vision-Language Models):

Multi-modal AI models that process both images and text to generate captions, answer visual questions, and create multimedia content (e.g. images, video, music).

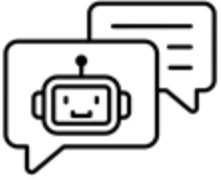
(Output: Text + Image Understanding + Image Captions + Multi-modal Analysis)

An Intro to AI

Where we're heading



Know the tools



Chatbots

Conversational AI designed for answering questions and engaging in text-based dialogue, often in customer support or casual interactions.

Example: ChatGPT – An AI chatbot that answers questions, generates content, and engages in conversation.



Assistants

AI tools that help users complete tasks by providing information, automation, and recommendations, like AI-powered productivity apps.

Example: Google Assistant – A voice-activated AI that helps with tasks like setting reminders, searching the web, and controlling smart devices.



CoPilots

AI companions that enhance human workflows by providing contextual suggestions, automation, and decision support in real time.

Example: GitHub Copilot – An AI-powered coding assistant that suggests code snippets and helps developers write better code faster.



Agents

Autonomous AI systems that can plan, execute tasks, and make decisions independently to achieve specific goals.

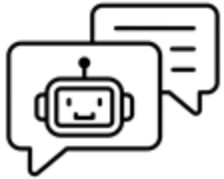
Example: Tesla FSD (Full Self-Driving) – An AI driving agent that makes real-time decisions for autonomous vehicle navigation.

Least
Complex

Most
Complex



5 Stages of AI Evolution



Chatbots

Early ChatGPT days:
reactive responses only.

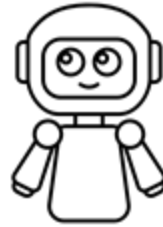
They **RESPOND**.



Reasoners

Advanced logic (like
GPT-4 & Claude).

They **THINK**



Agents

AI that acts and
executes tasks.

They **ACT**

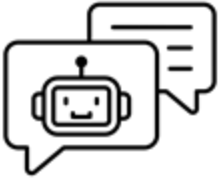


Where we are
now

Recent Past

Near
Future...

5 Stages of AI Evolution



Chatbots

Early ChatGPT days:
reactive responses only.

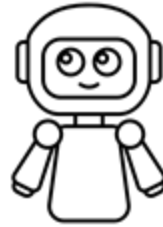
They **RESPOND.**



Reasoners

Advanced logic (like
GPT-4 & Claude).

They **THINK**



Agents

AI that acts and
executes tasks.

They **ACT**



Innovators

AI that invents new
ideas and solutions.

They **INVENT**

E.g. New medicines,
climate solutions,
even breakthroughs
in physics



Organisations

AI that operates entire
companies autonomously.

They're **SELF-SUFFICIENT**

E.g. Entire departments and
companies run by
autonomous AI

Recent Past

Near
Future...

Questions?



Key Takeaways:

- **AI has vast potential in many different areas of innovation**
- **Generative AI is a subset of AI** that uses informed predictions to generate new media (text, images, video etc) based on large sets of training data
- **Engaging critically** with gen-AI means we unlock its potential – and not reduce our own capabilities

Next up...

In this week's seminar, we'll start practising how best to engage with AI through effective **prompt engineering**.

Please take a look at your calendars to see what session (A,B,C,D,E,F or G) you are in and what room to go to.

Not sure? Ask one of us.

Seminar details:

Session Times and Room numbers	
A 1pm – 3pm in Room 2.405	D 4pm – 6pm in Room 1.405
B 1pm – 3pm in Room 5.430	E 4pm – 6pm in Room 2.405
C 1pm – 3pm in Room 1.620	F 4pm – 6pm in Room 3.315