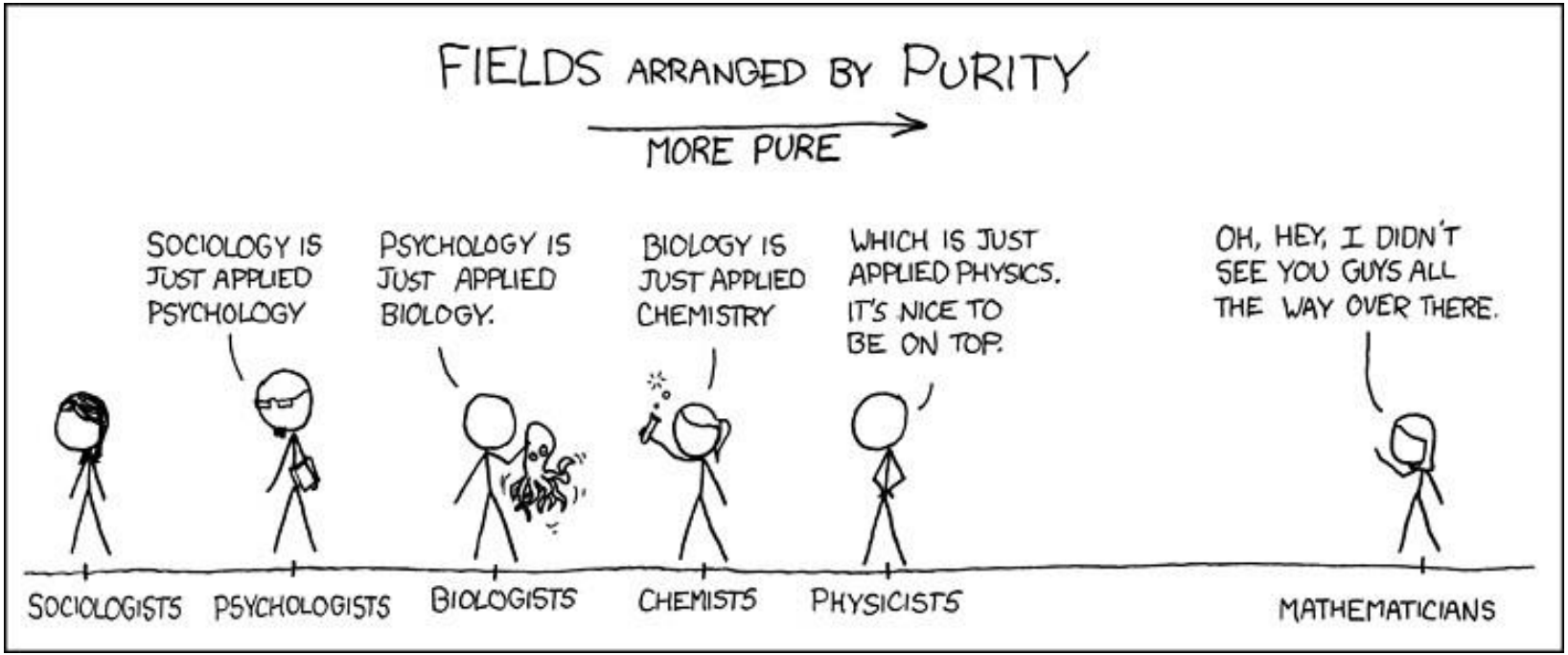
Warwick Business School

# Data Science & Generative AI

**Dr Michael Mortenson**
**Associate Professor (Reader)**
*michael.mortenson@wbs.ac.uk*


## Session 1: Introduction to the Module, Data Science & GenAI

# 1.1 What This Module is Not…



# 1.1 What This Module is Not…

NEWS

Home | InDepth | Israel-Gaza war | War in Ukraine | Climate | UK | World | Business | Politics | Culture | More

Technology

## OpenAI boss: Meta offering $100m plus to poach my staff

### Top stories

**Police to get broader powers to restrict repeated protests**

14 minutes ago

**My approach will pay off eventually, says Kemi Badenoch**

4 minutes ago

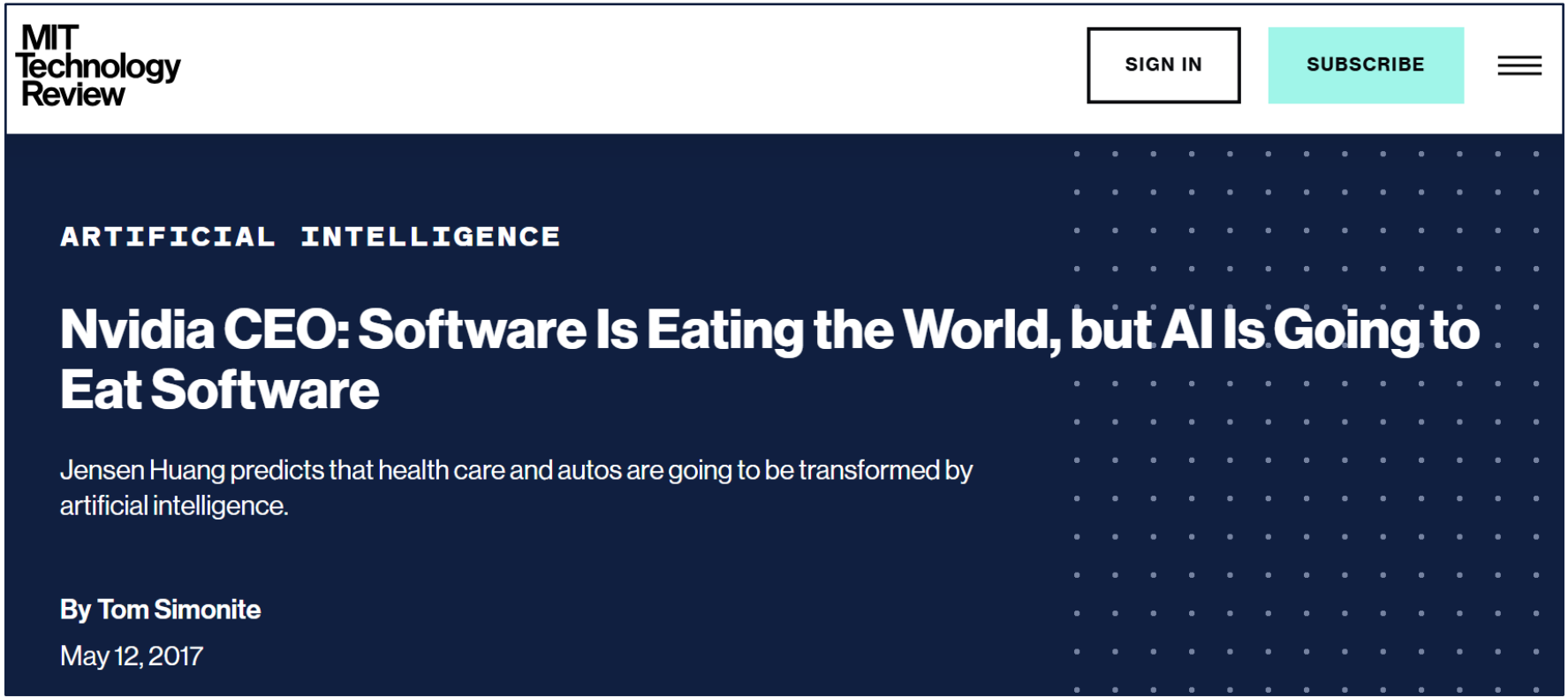
**Netanyahu says he hopes to announce hostage release in the 'coming days'**

14 hours ago



https://www.bbc.co.uk/news/articles/c8730088e5do

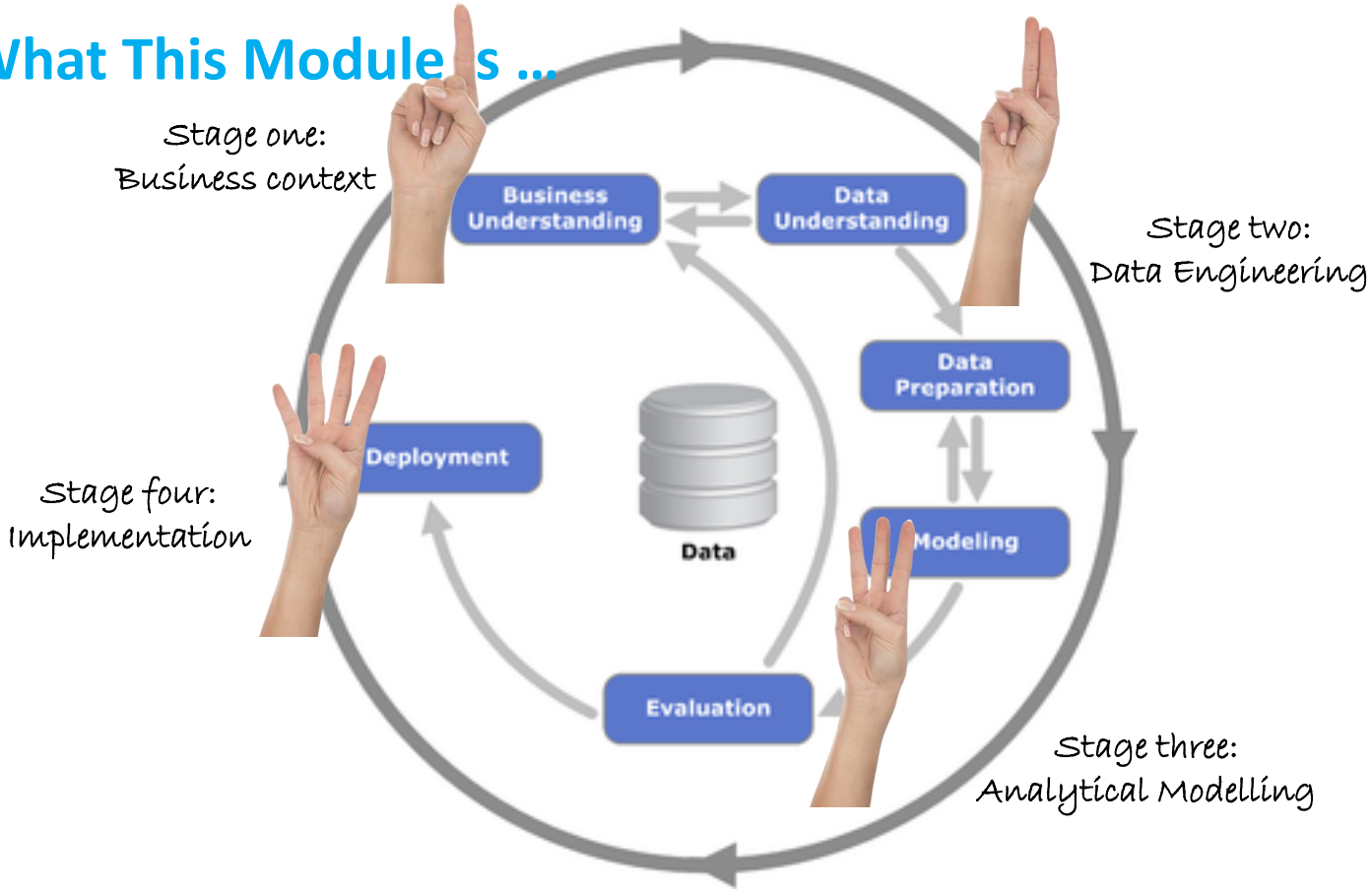
# 1.2 What This Module is…






https://www.technologyreview.com/2017/05/12/151722/nvidia-ceo-software-is-eating-the-world-but-ai-is-going-to-eat-software/

# 1.2 What This Module is …



# 1.2 What This Module is …

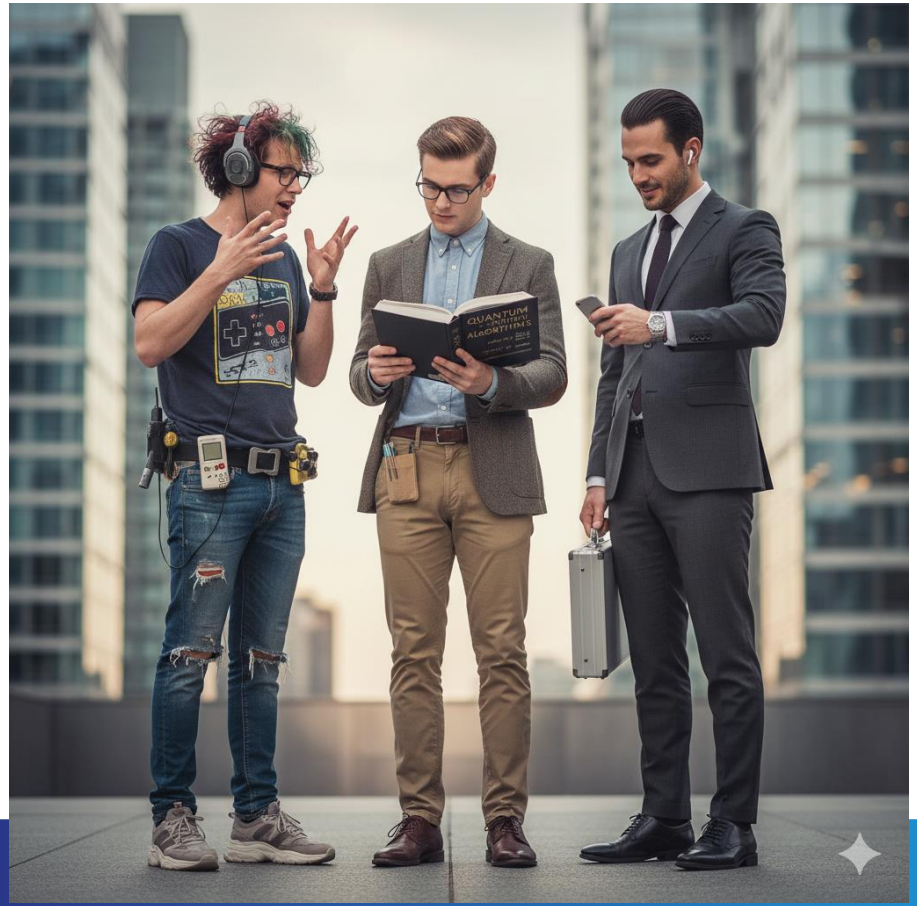



**Image Credit**: https://nationalcioreview.com/articles-insights/technology/artificial-intelligence/vibe-coding-moves-into-the-mainstream/

# 1.3 Who This Module is For …

- Non-technical students who want a technical career in data science and AI (for whom this will be the start of that journey).
- Technical students who want to learn more on the applied side of data science and AI.
- Students interested in management or other business roles in data science and AI (e.g. project management, CIO, etc.) and want to learn more about these workflows.
- Students interested in working with AI, data science methods and “vibe coding” to build products and projects.

# 1.3 Who This Module is For …



# 1.4 Module Objectives

*By the end of the module, students should be able to:*

- Apply best practices in modern data and feature and engineering techniques.
- Demonstrate a theoretical and practical understanding of key models in classical machine learning, deep learning and generative AI.
- Evaluate ESG concerns within the context of artificial intelligence systems.
- Critically appraise machine learning and artificial intelligence applications in a variety of business contexts.
- Apply appropriate problem solving skills.
- Demonstrate critical and logical thinking.
- Employ an analytical mindset to a range of problems.

# 1.5 Module Philosophy

- Hands > Ears.
- Too much of AI and data science is gatekept behind algebra, programming code and other geekery/nerdery.
- If software is eating the world, and AI is eating software, everyone needs a minimum level of knowledge in these domains.
- Generative AI, “vibe coding” and process/task automation are powerful and necessary tools. While anyone can do it, only some people do it well.
- Today’s AI cannot perform complex tasks as well as human specialists.
- A human specialist cannot perform complex tasks as well as human specialists efficiently and effectively using AI tools.

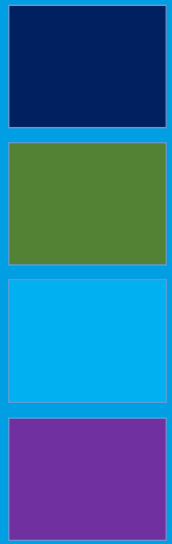
# Session Structure

Introduction

**Module Administration**

Data Science and Generative AI

Asynchronous Tasks



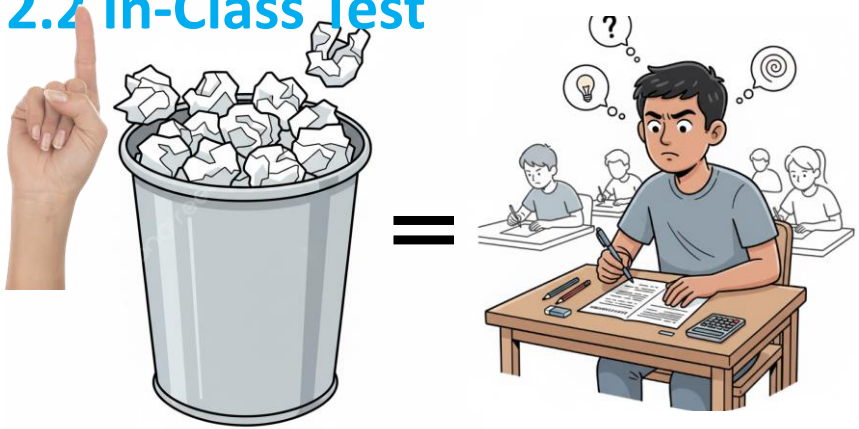
# 2.1 Timetable and Assessment

- Lectures on Mondays – week 1 to 9
- Seminars on Fridays – week 2 to 10
- Asynchronous tasks (~1 hour) designed to be completed between the lecture and the seminar.
- Office hour* will be between 1015 and 1130 on Mondays from week 2 to 10. WBS building, room 0.209 (close to South Entrance).
- In-class test (next slide) in the lecture room in week 10 (replaces the lecture). In-person attendance is required.
- Individual assessment due ~3-4 weeks after the module finishes. Week 10 seminars will provide additional support for this aspect.



**Yes, I am aware that is longer than an hour*

# 2.2 In-Class Test



= ?

## 2.2 In-Class Test

- You will have 50 minutes, in the lecture theatre, to build a data science product (e.g. a dashboard or a machine learning model).
- The goal is to make the assessment as close to IRL as possible. In practice, everyone I know uses GenAI to some extent to help them build data science products. Some use it better than others!
- You will, therefore, be **EXPECTED** to use GenAI in some way to help you in your task. It will be hard to complete without it.
- Your submission will be both the product (code) and also a transcript of your chat with the GenAI tool. Both will be assessed!

# 2.2 In-Class Test

## 2.3 Individual Assignment (post-module)

- Over the course of the module you will be asked to build up a GitHub repository of the work you do. This will be part of the assessment, but also acts as an online portfolio of your work.

- In the end-point assessment you will be asked to reflect upon your GitHub repo and the elements that you feel are most important to your development in AI and data science. You will also be asked to reflect on how these methods will impact your future career.

- There will be an additional question relating to a topic in data science and AI (standard format).

## 2.4 Laptop and/or Internet-enabled Device

- (From the my.wbs web page) "*This module will incorporate significant hands-on activities. Please bring a charged laptop (ideally) or internet enabled device (larger than a phone) to each seminar*".

- This will be essential for the in-class test. If you are not able to access such a device, please contact me as soon as possible (michael.mortenson@wbs.ac.uk).

- You do not need to have a powerful machine to run these activities!

## 2.5 Development Environment

- All coding exercises will be performed using Google Colab. This provides online access to a virtual machine (with GPUs when required) in the cloud. We all work in the same environment and with the same computer resources.

- Code and exercises (asynchronous tasks and some seminars) will be shared via the GitHub Module Repository available here: https://github.com/MJMortensonWarwick/IB2AD0_Data_Science_GenerativeAI.

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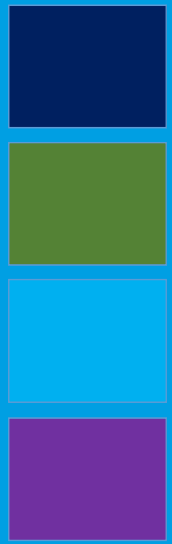

# 3.1 Why Data Science?

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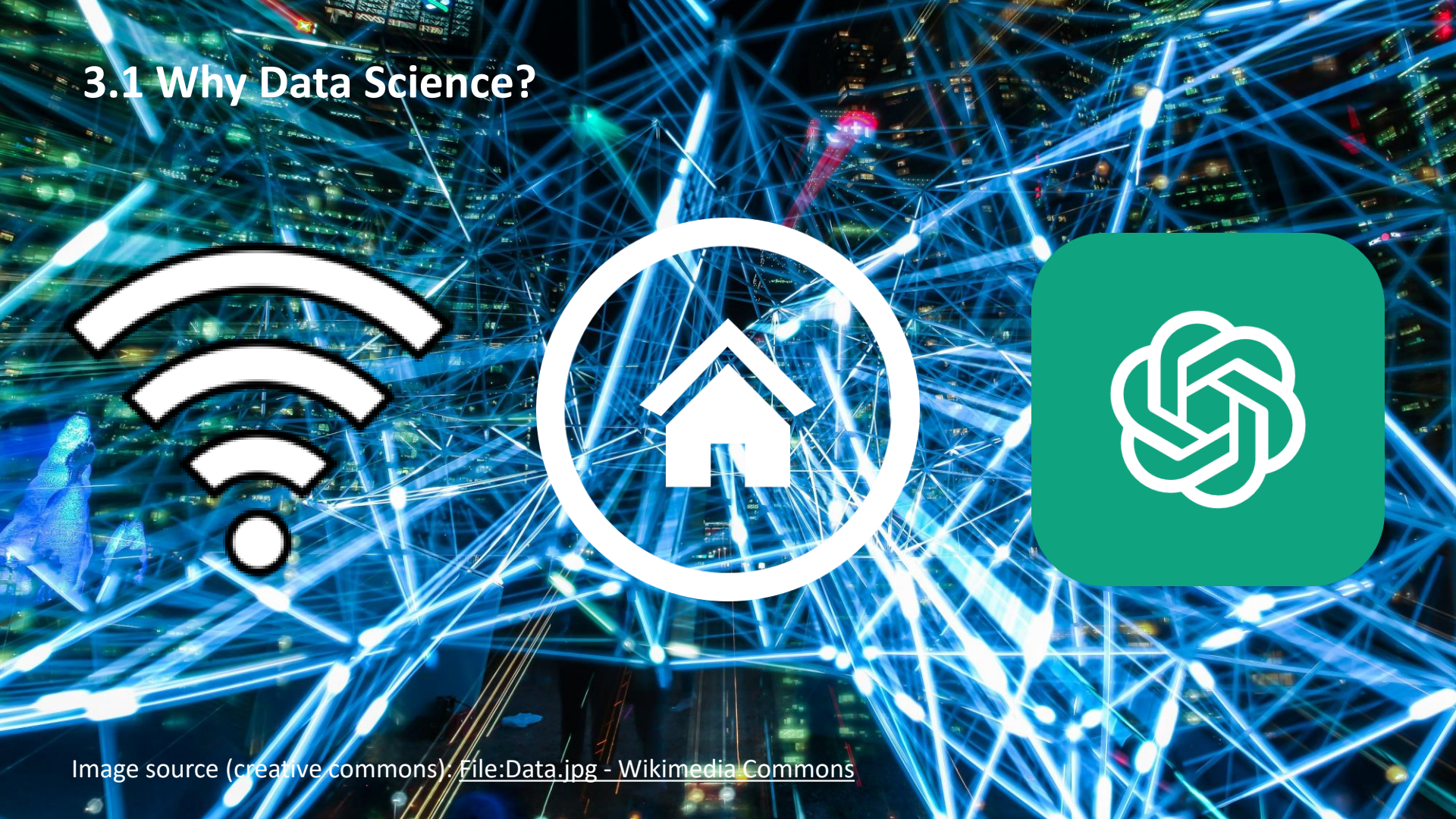
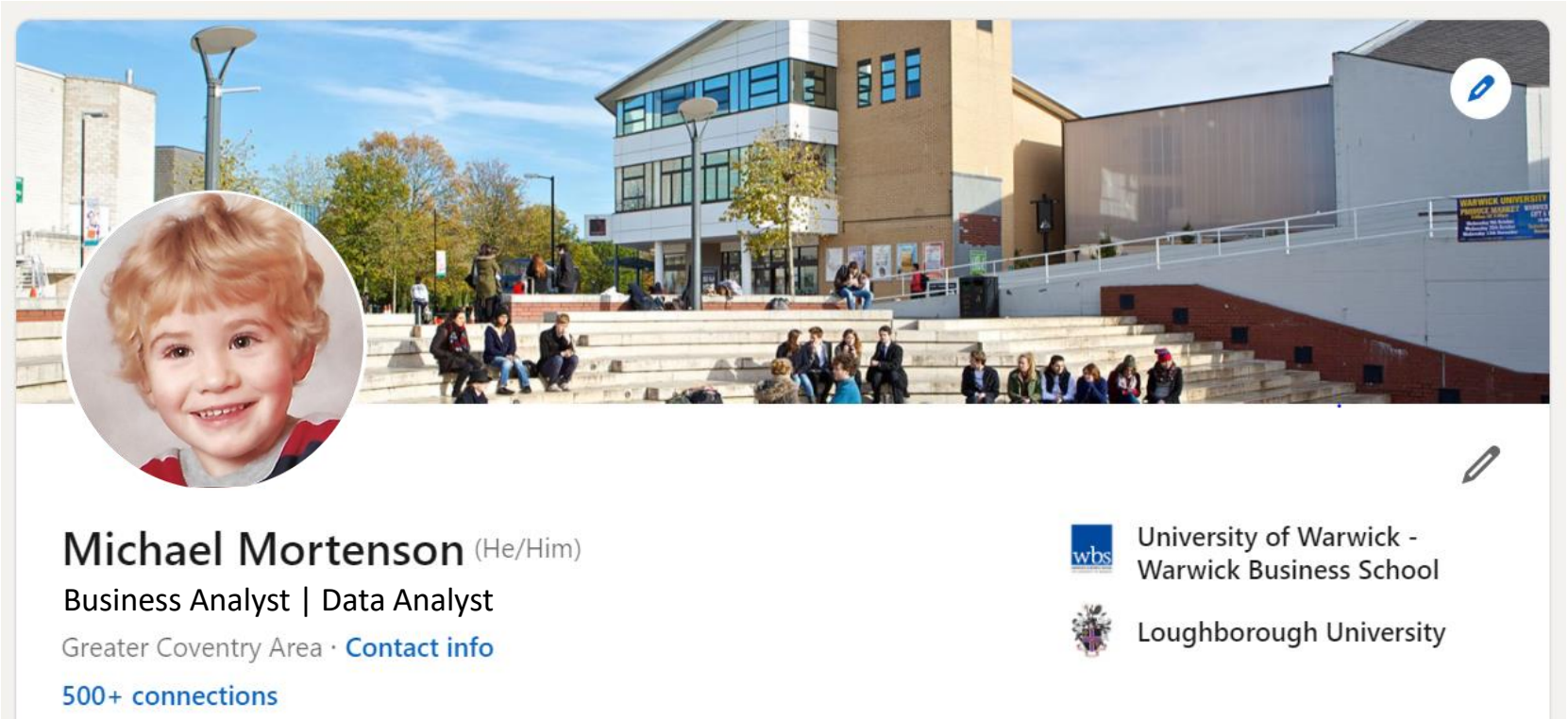


Image source (creative commons): File:Data.jpg - Wikimedia Commons

# 3.1 Why Data Science?

Image source (creative commons): https://morningstaronline.co.uk/sites/default/files/styles/article_full/public/zbynek-burival-GrmwVnVSSdU-unsplash.jpg?itok=EObuKnRY&c=ef17667d17ca75f0f9b22106b473877d

# 3.2 From “Analyst” to “AI”



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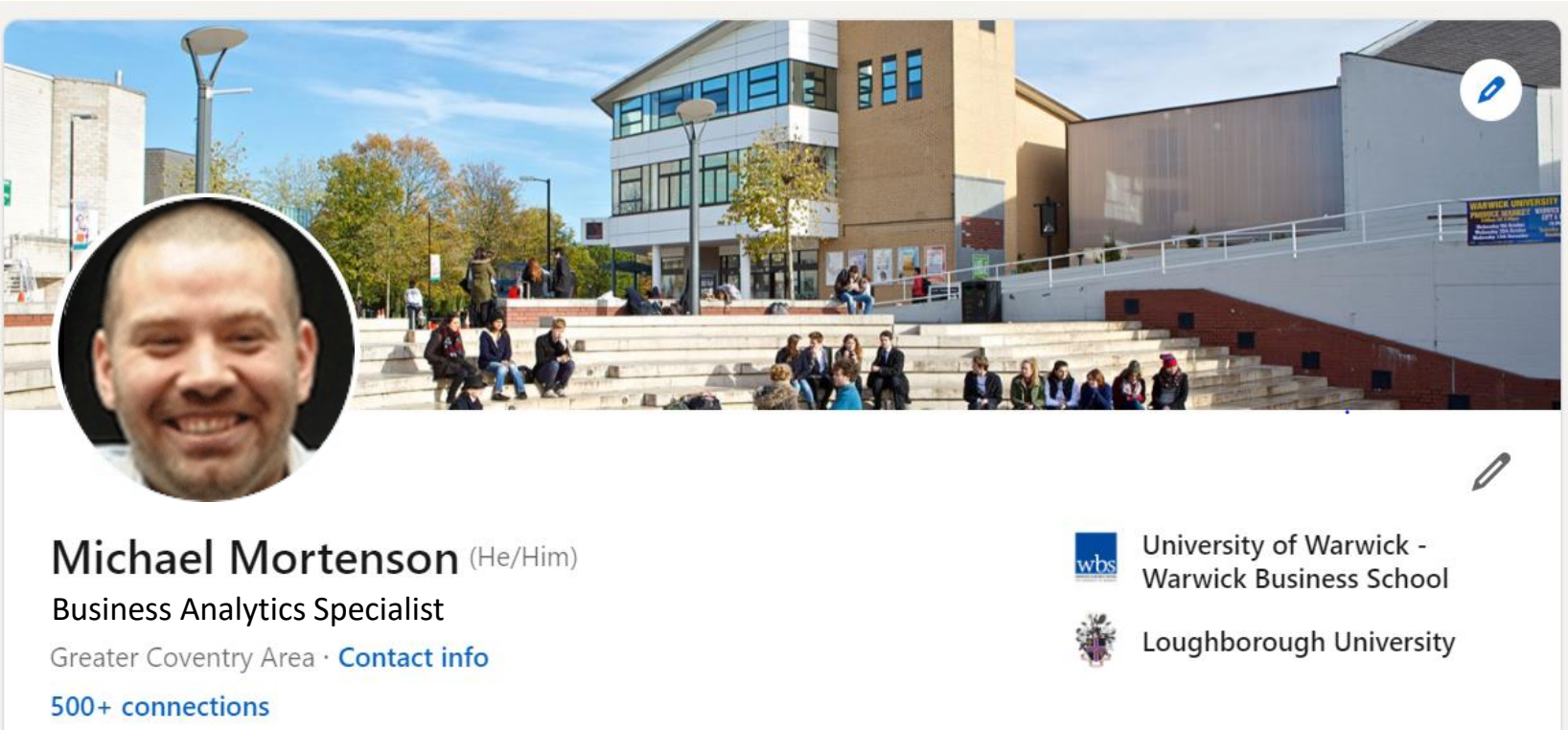

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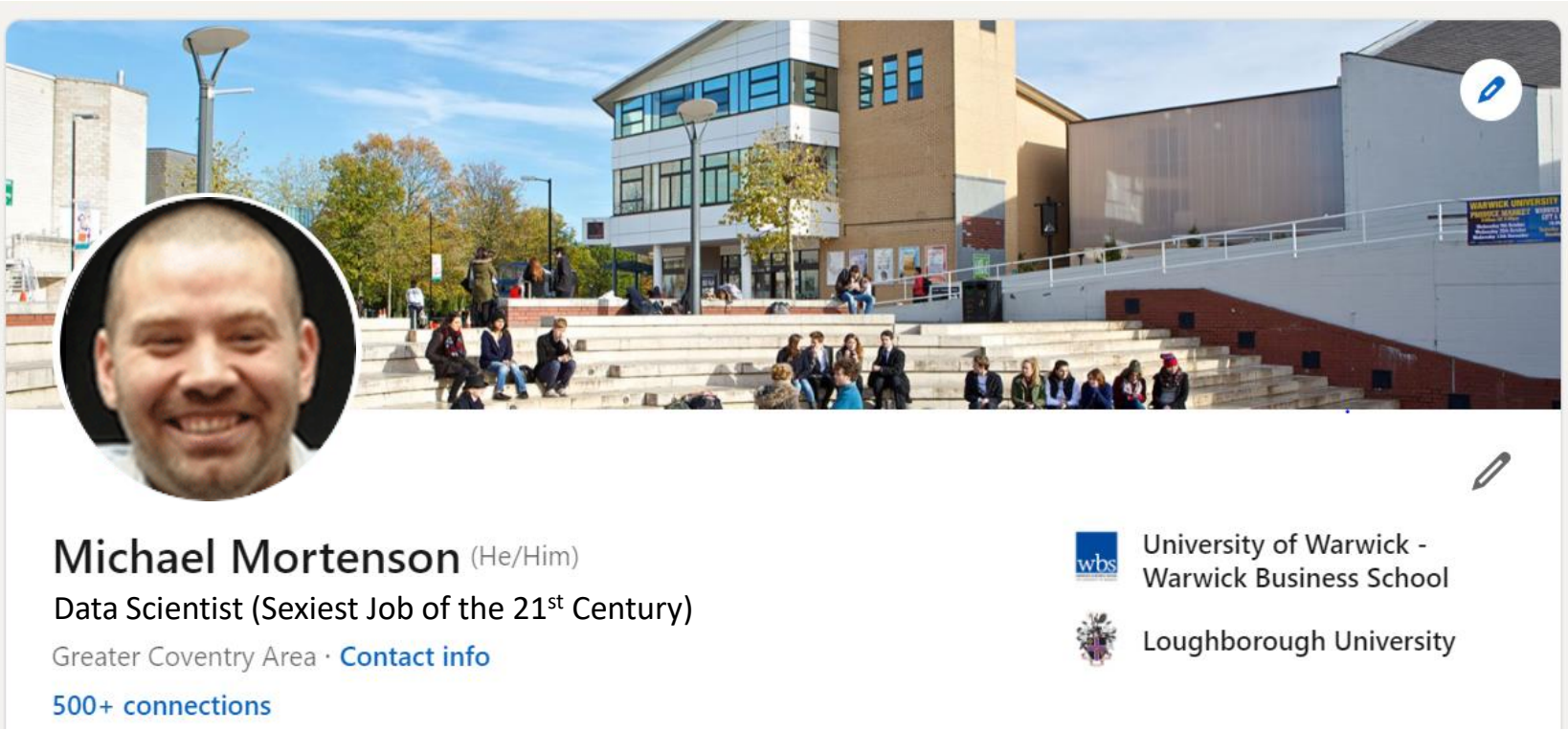

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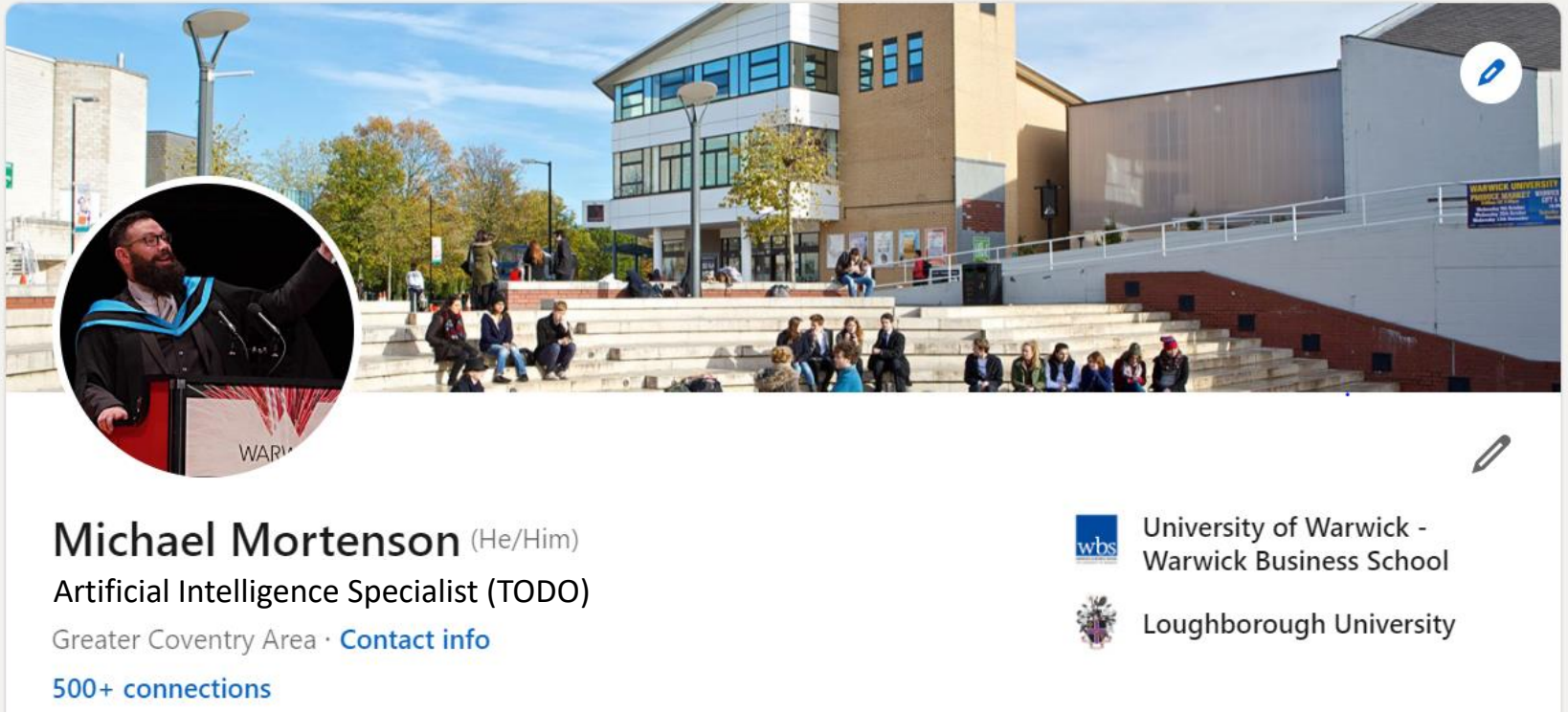
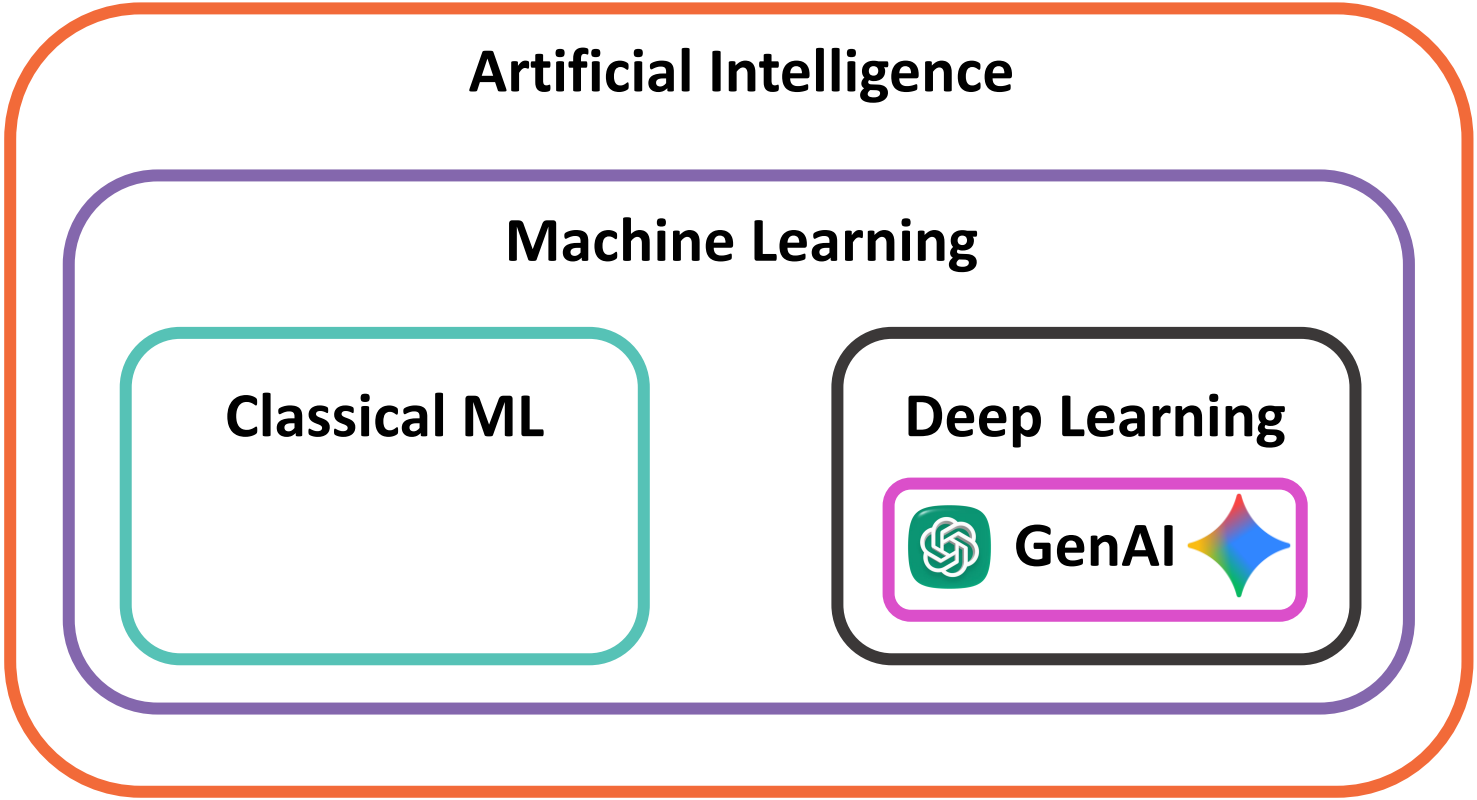


# 3.3 Is AI Just a Rebrand?

*People don't want to buy a quarter-inch drill. They want a quarter-inch hole!*

Theodore Levitt

# 3.4 What is AI?


Artificial Intelligence
Machine Learning
Classical ML
Deep Learning
GenAI

## 3.4 What is AI?

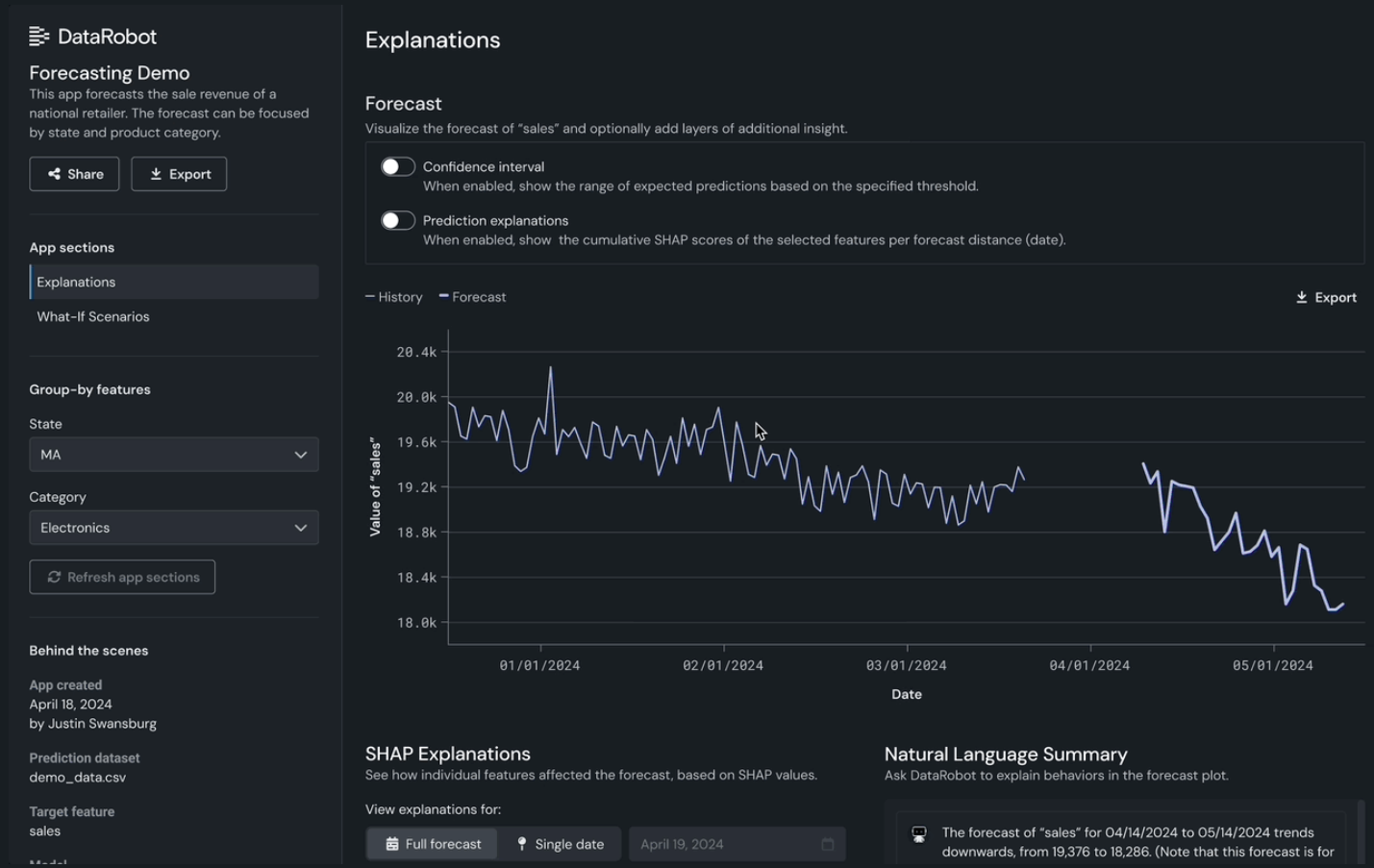
*[AI is] the branch of computer science dedicated to making computers work the way they do in the movies.*

Alan Blackwell (2024)



Blackwell AF (2024). *Moral Codes: Designing alternatives to AI.* MIT Press: Cambridge (MA).

# 3.5 AI, Data Science and Automation



# 3.6 Can Data Science Survive Automation?

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- **Take off:** Acting as the interface between AI tools and the business. Translating business problems into tasks that can be solved by human workers and AI agents. Enriching business data to maximise the performance of human-AI systems.
- **In flight:** Supervising the AI models. Inspecting methodologies and results. Adjusting the “flight path” as the work progresses.
- **Landing:** Translating the results of the work into business actions. Influencing and supporting business decision makers. Monitoring and optimising automated systems.

## 3.6 Can Data Science Survive Automation?

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