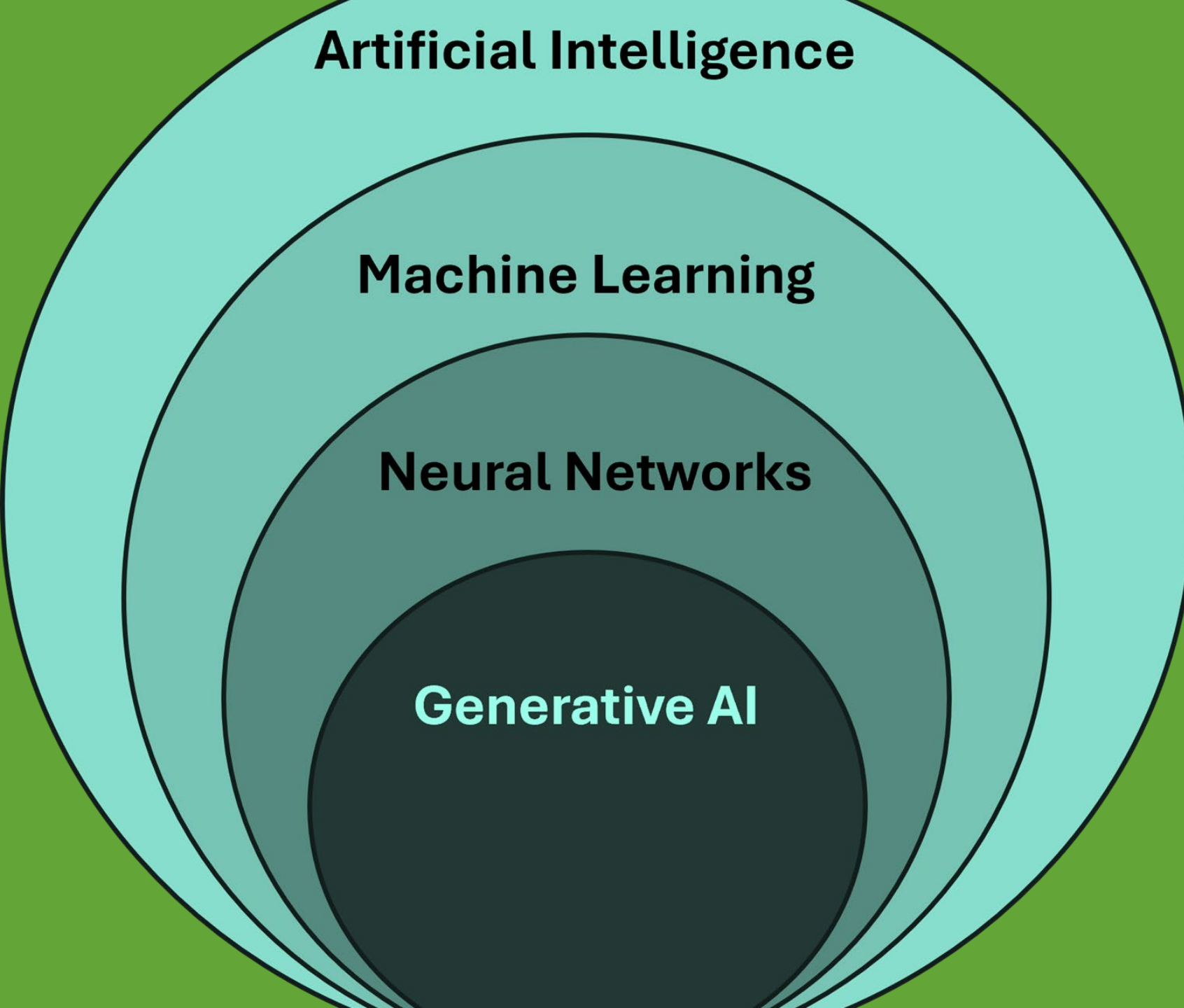




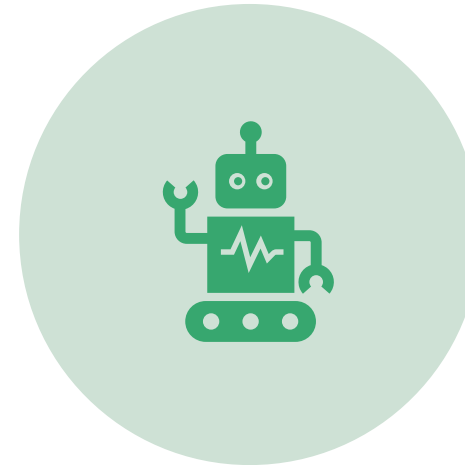
AI RELATIONS

Lecturer: Mark Gillan

COVERING



HOW GENERATIVE AI DIFFERS
FROM TRADITIONAL AI SYSTEMS



THE RELATIONSHIP BETWEEN
ARTIFICIAL INTELLIGENCE, DATA
SCIENCE, AND MACHINE LEARNING

WHAT IS ARTIFICIAL INTELLIGENCE?

A discussion point: What is AI and how does it work?

Artificial Intelligence (AI) refers to computer systems that perform tasks normally requiring human intelligence.

These tasks include learning from data, recognising patterns, problem solving, and decision making.

AI systems improve their performance by using data.

AI is a broad term that includes many different technologies and approaches.

TRADITIONAL AI SYSTEMS

- Traditional AI systems are designed to carry out **specific, narrow tasks**.
- They often follow rules or use machine learning to make predictions or decisions.
- Outputs are usually classifications, scores, or yes/no decisions.
- Traditional AI does **not** create new content.

Examples:

- Email spam filters
- Fraud detection in banking
- Facial recognition systems

GENERATIVE AI SYSTEMS

- Generative AI systems are designed to **create new content**.
- They can generate text, images, music, audio, and video.
- Outputs are original but based on patterns learned from large data sets.
- Users interact with generative AI using prompts.

Examples:

- AI chat systems
- Image generation tools
- Music and sound generators

HOW GENERATIVE AI IS DEVELOPED



Generative AI is built using deep learning and neural networks.



Models are trained on extremely large data sets, often containing billions of examples.



Training involves adjusting internal values so the system learns patterns in data.



This process requires significant computing power and time.

WHAT IS DATA SCIENCE?

- Discussion points:
 - What is Data Science?
 - What does it do?
 - How does it help us?
- Data science focuses on collecting, cleaning, organising, and analysing data.
- It uses statistics and computing to find patterns and trends.
- Data science ensures data is accurate, relevant, and usable.
- Without data science, AI systems cannot be trained effectively.

Examples:

- Analysing exam results
- Studying customer behaviour
- Monitoring environmental data

WHAT IS MACHINE LEARNING?

- Machine learning is a subset of artificial intelligence.
- It allows systems to learn from data rather than being explicitly programmed.
- Models improve their performance as they are exposed to more data.
- Machine learning is used in both traditional AI and generative AI systems.

Examples:

- Image recognition
- Speech recognition
- Recommendation systems

RELATIONSHIP: AI, DATA SCIENCE, MACHINE LEARNING

- Artificial intelligence is the broadest concept.
- Machine learning is a method used to create AI systems.
- Data science provides the data that machine learning models learn from.
- All three areas depend on each other.



HOW DO THEY WORK TOGETHER?

- Discussion Point:
 - How do they work together?
- Data science collects and prepares large data sets.
- Machine learning uses this data to train models.
- AI systems use trained models to perform intelligent tasks.

Example:

- Shopping data is collected and cleaned
- A machine learning model learns customer patterns
- An AI system recommends products to users

GENERATIVE AI WITHIN RELATIONSHIP

- Generative AI relies heavily on machine learning techniques.
- It requires very large data sets prepared using data science methods.
- The trained AI system generates content in response to user prompts.
- This shows how AI, data science, and machine learning work together.



SUMMARY OF LEARNING



- Traditional AI focuses on prediction, classification, and decision making.
- Generative AI focuses on creating new content.
- Data science prepares and analyses data.
- Machine learning allows AI systems to learn from data.
- Understanding these differences and relationships is essential for assessment.