
# GENERATIVE V TRADITIONAL AI

Lecturer: Mark Gillan

# WHAT IS GENERATIVE AI?

Generative AI is a type of AI that can *create new content*.

It produces outputs such as text, images, music, audio, and video.

The output is not copied directly from training data.

Instead, it generates new material based on learned patterns.

# EXAMPLES OF GENERATIVE AI IN USE

- Text generation (essays, summaries, chatbots).
- Image generation from text descriptions.
- Music and sound generation.
- Video and animation creation.


- Where have you seen AI-generated content online?
- Reinforcement: these systems respond to prompts.

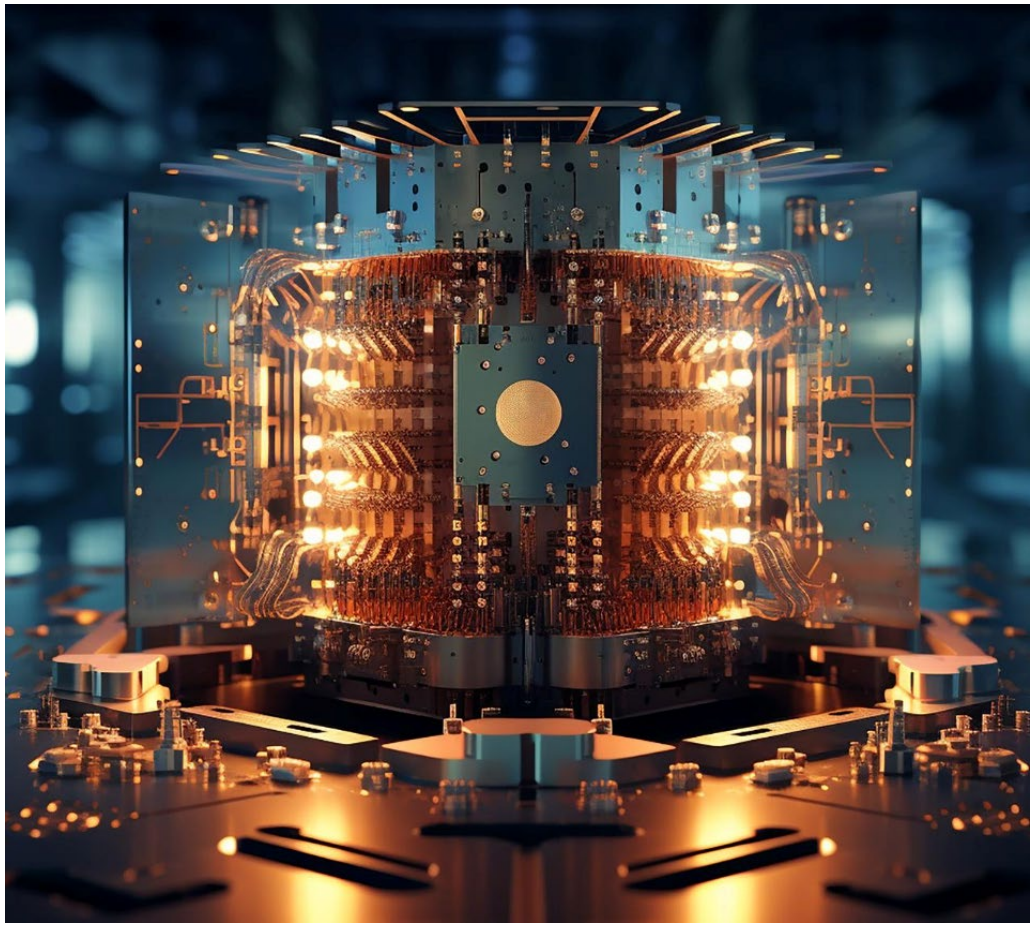
# HOW GENERATIVE AI IS MADE UP

- Built using large-scale machine learning models.
- Trained on very large data sets (often billions of examples).
- Uses neural networks with many layers.
- Requires significant computing power.
  - Data size huge (big data)
  - Processing Power huge increase

# CORE TECHNOLOGIES BEHIND GENERATIVE AI

- Built using large-scale machine learning models.
- Trained on very large data sets (often billions of examples).
- Uses neural networks with many layers.
- Requires significant computing power.

- NOTE: Neural networks based upon the human brain



# TRAINING GENERATIVE AI SYSTEMS

- Models learn by analysing patterns in data.
- Training involves adjusting internal weights.
- Uses trial and error to improve outputs.
- Training takes weeks or months on powerful computers.

- NOTE: Humans do NOT hard code responses from Generative AI

# WHAT ARE TRADITIONAL AI SYSTEMS?

- Traditional AI focuses on specific tasks.
- Often rule-based or narrowly trained.
- Does not create new content.
- Examples include spam filters and recommendation engines.


Learning notes:

- Traditional AI usually gives a decision or prediction.
- Outputs are limited and controlled.

# EXAMPLES OF TRADITIONAL AI

- Email spam detection
- Facial recognition systems
- Fraud detection systems
- Recommendation algorithms

Learning notes:

- These systems classify or predict.
- They do not generate original content.

# KEY DIFFERENCES: OUTPUT

## Generative AI

- Creates Original Content
- Outputs are Flexible and Varied

## Traditional AI

- Analyses, classifies, or predicts
- Outputs are fixed or limited

# KEY DIFFERENCES: TRAINING AND DATA

## Generative AI

- Extremely LARGE datasets
- AI models are general purpose
- Broad use

## Traditional AI

- Uses smaller, specific task data
- Narrow in scop
- Narrow use

# KEY DIFFERENCES: RISKS & CHALLENGES

## Generative AI

- May produce incorrect or misleading content
- Risk of hallucinations
- Raises new ethical concerns

## Traditional AI

- Bias
- Incorrect predictions

| Feature | Generative AI | Traditional AI |
|---|---|---|
| **Main purpose** | To create new content | To analyse data and make decisions |
| **Type of output** | Text, images, music, audio, video | Classifications, predictions, decisions |
| **Creativity** | Produces original-looking content | Does not create new content |
| **Typical tasks** | Writing text, generating images, composing music | Fraud detection, spam filtering, face recognition |
| **Scope** | General-purpose across many tasks | Narrow and task-specific |
| **Training data size** | Extremely large data sets | Smaller, focused data sets |
| **Core technology** | Deep learning and large neural networks | Rules, machine learning, or simple models |
| **Human input** | Uses prompts to guide output | Uses predefined inputs and rules |
| **Flexibility of output** | High – outputs vary each time | Low – outputs are consistent |
| **Risk of misinformation** | Higher (can generate incorrect content) | Lower (limited to trained task) |
| **Examples** | AI chat systems, image generators | Spam filters, recommendation systems |
| **Assessment keyword** | *Generates* content | *Predicts, classifies,* or *detects* |

# DIFFERENCES LISTED – REMEMBER THEM!

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Image aid to learning

# SUMMARY


- Generative AI creates new content.
- Traditional AI analyses existing data.
- Generative AI relies on large models and data sets.
- Both types have benefits and risks.