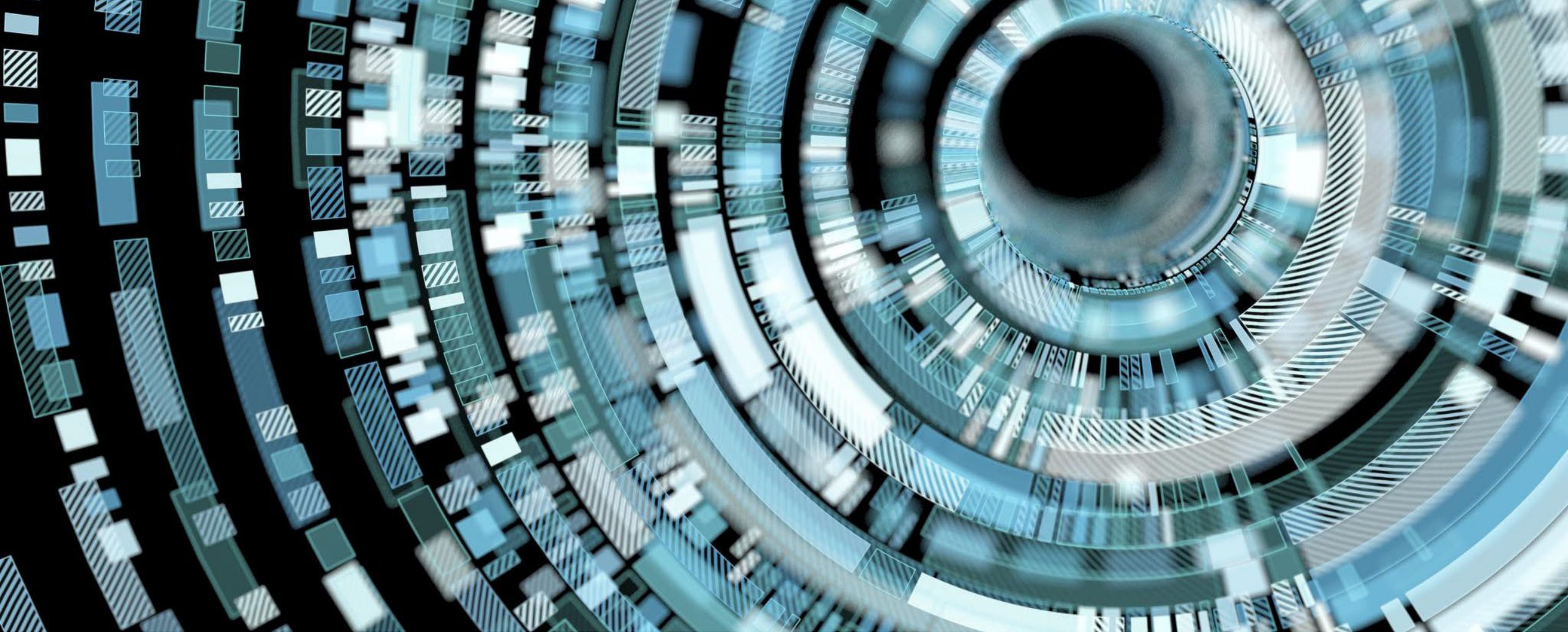
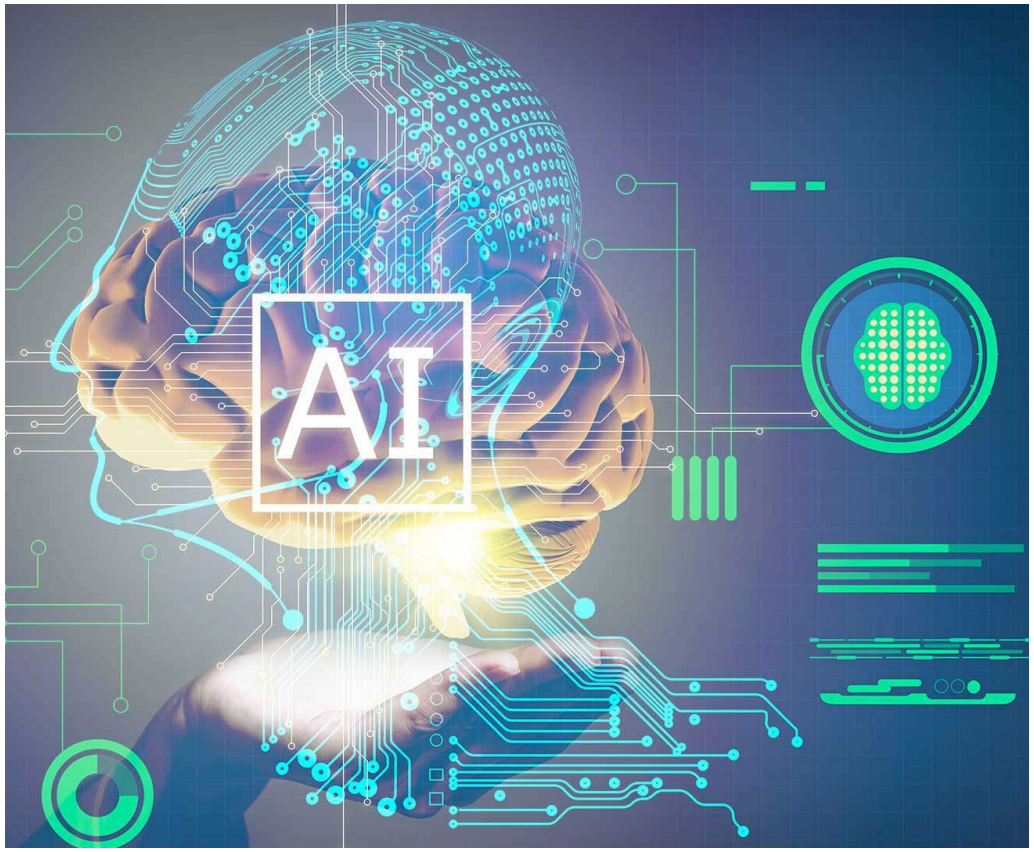


SUPERVISED V UNSUPERVISED AI LEARNING

Lecturer: Mark Gillan

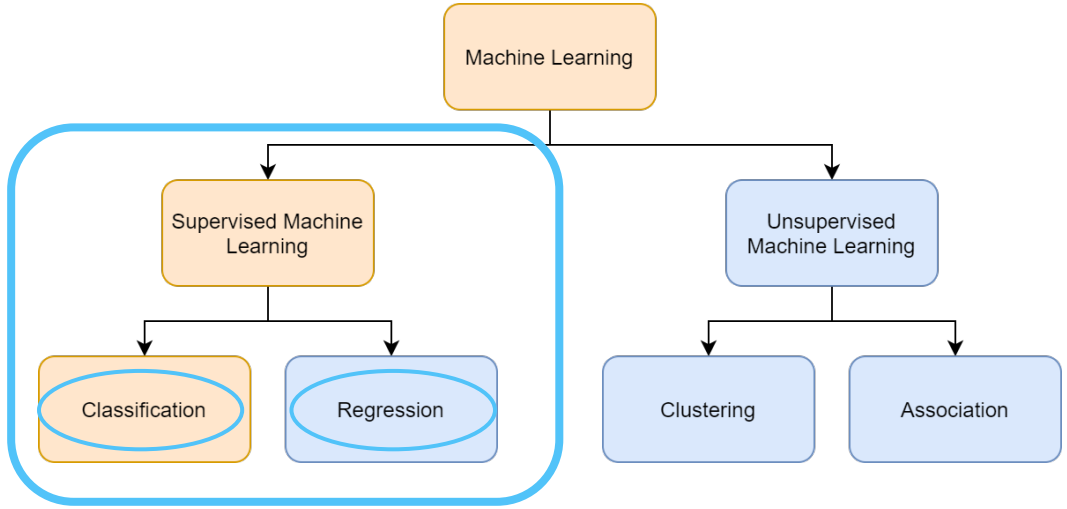
GUIDING AI THROUGH THE FOG

- Imagine AI as a college student.
- They need guidance as to how to learn to enable their future learning to take place.
- Supervised and unsupervised learning defines how we teach the student to make sense of the world and ultimately use their own approach.

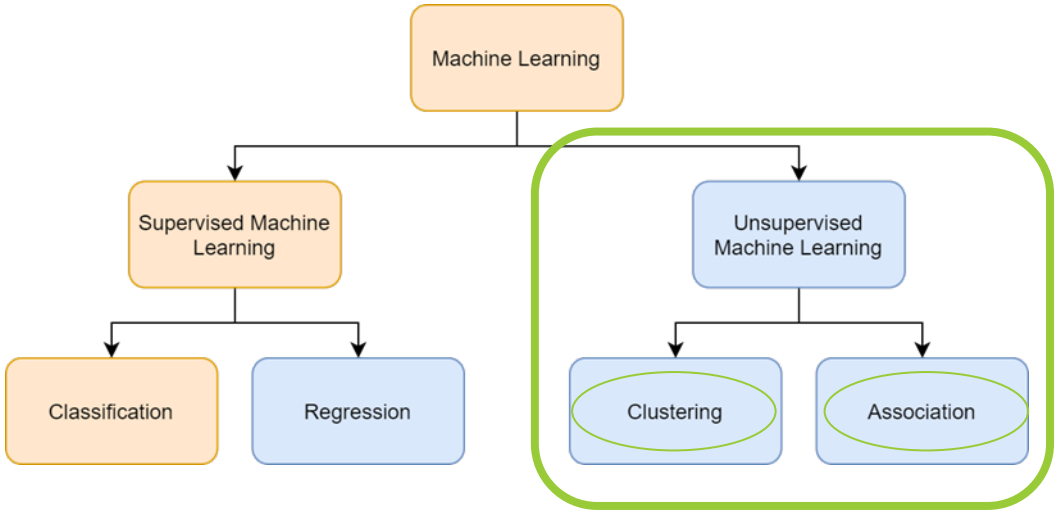


SUPERVISED LEARNING

- Learning with Labels: Think of labelled flashcards – each data point has a pre-defined answer (like "cat" for an image). The AI learns to map inputs to outputs by analysing these labelled examples.
- Tasks & Applications:
  - Classification
    (spam detection, image recognition)
  - Regression
    (predicting stock prices, weather forecasting).



UNSUPERVISED LEARNING



- Exploration and Discovery:

Picture exploring a map without landmarks – the AI finds patterns and structures in unlabelled data on its own.

- Tasks & Applications:
  - Clustering (grouping data)
  - Dimensionality Reduction (compressing data for efficient storage)
  - Anomaly Detection (spotting suspicious network activity)

KEY DIFFERENCES

Supervised Learning

- Needs labels
- **Predicts** outputs
- More accurate for specific tasks but needs time consuming labelling
- Excels at specific predictions
- Applications:
  - Spam detection
  - Weather forecasting
  - Price predictions

Unsupervised Learning

- Does NOT need labels
- Finds **patterns** for insights
- Wildly inaccurate without human interception and validation
- Excels at general insights
- Applications:
  - Anomaly detection
  - Customer personas
  - Medical imaging