# Lecture 2 (What is AI?)

# 1 What is Intelligence (Continuation)

## 1.1 Planning Tasks

1. Predicting Structures
    i. Structure of amino acids
    ii. How a protein folds
2. Sequential decision-making
    i. Game playing
    ii. Treatment recommendation

## 1.2 Logic and Reasoning

1. Logical Systems
    i. Theorem provers
    ii. Fault diagnosis
    iii. Medical diagnosis
    iv. Manufacturing planning
2. Methods
    i. Deduction systems
    ii. Constraint satisfaction
    iii. Satisfiability solvers

## 1.3 Robotics/Embodied AI

1. Autonomous cars
2. Manipulation tasks
3. Unmanned exploration
4. Machine capable of walking

# 2 When is AI capability displayed?

1. Human centred

      i. Comparing with human performance
      ii. Empirical observations and hypothesis about human behaviour
2. Engineering viewpoint
      i. Rationality
      ii. Performance wrt an objective
3. Thinking vs Acting

# 3 Thinking and Acting Humanly

## 3.1 Turing Test (Acting Humanly)

For AI to pass the **Turing Test**, the following is needed: 1. NLP 2. Knowledge representation 3. Automated reasoning 4. ML 5. Computer vision 6. Robotics

## 3.2 Thinking Humanly

1. Cognitive Science
      i. How humans or animals percieve and act in the world
      ii. Tested using introspection and psychological experiments
2. Aim of an AI system:
      i. To match the cognitive modeol of a human
      ii. Inform our understanding of human reasoning

# 4 Thinking and Acting Rationally

1. Understanding the thought process
2. Reflex actions exist too

# 5 Agent in AI

An agent is any entity which perceives the *environment* through *sensors* and acts upon it through *actuators* such that the *performance measure* is maximised (for a good agent).

# 6 Domain Characteristics

1. Fully vs Partially observed
2. Single vs Multiple agents
3. Deterministic vs Stochastic
4. Episodic vs Sequential
5. Static vs Dynamic
6. Discrete vs Continuous