COMP250: Artificial Intelligence

1: Introduction to AI

Proposal

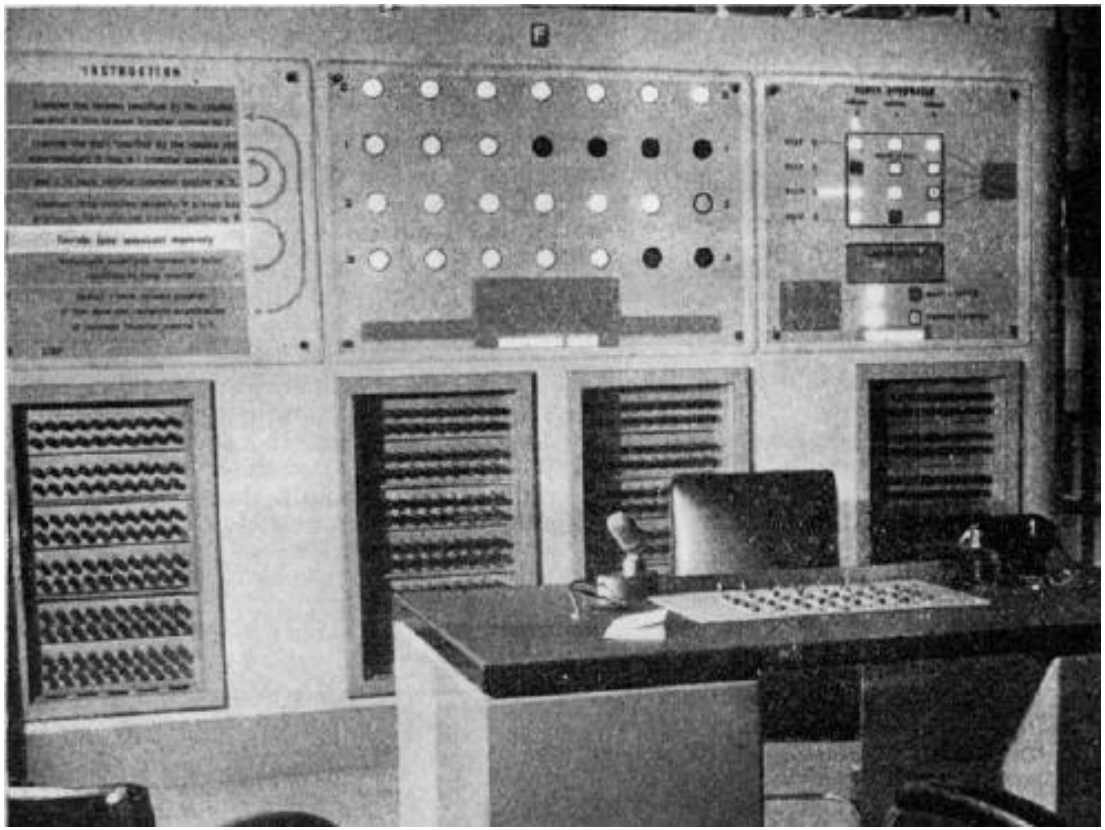
- For next week!
- Prepare a 1-2 page proposal document covering the following:
  - What is the high concept of your computing artefact?
  - What functionality will your component include?
  - How does your component fit into your chosen specialism?
  - Why is this artefact needed?
  - What are the key requirements?
  - Is the scope appropriate for the product development time-frame?
  - How will you address the architect and research requirement?

AI in games

What is AI?

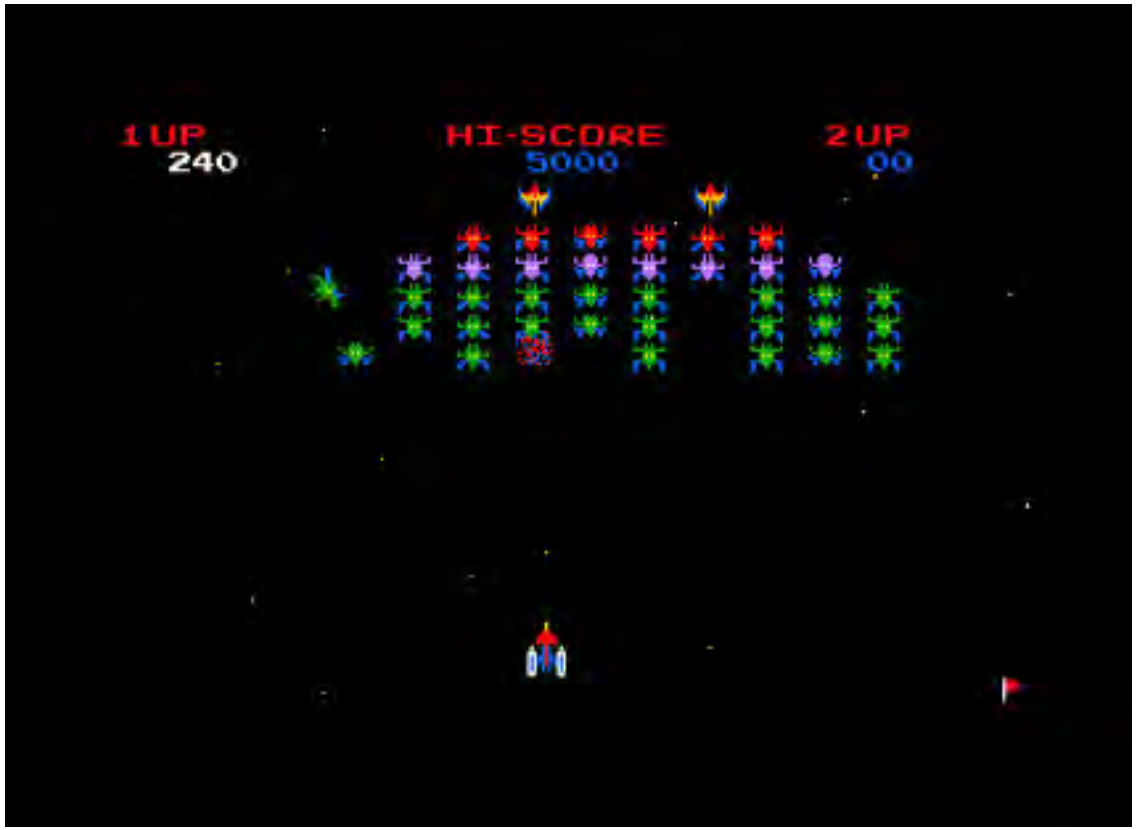
- Recall COMP280 session 7
- Performing tasks by machine (or by software) which would ordinarily require human intelligence
- Making decisions to achieve goals
- In games, AI systems break down roughly into two categories:
  - Authored behaviours: AI follows (often sophisticated) rules set out by a designer
  - Computational intelligence: AI behaviour emerges from an algorithmic system

Nimrod (Ferranti, 1951)



Samuel's Checkers program (IBM, 1962)

Galaxian (Namco, 1979)



Pac-Man (Namco, 1980)

Deep Blue (IBM, 1997)

Half-Life (Valve, 1998)

The Sims (Maxis, 2000)

Black & White (Lionhead, 2001)

Façade (Mateas & Stern, 2005)

Chinook (Schaeffer et al, 2007)

Left 4 Dead (Valve, 2008)

Watson (IBM, 2011)

Deep learning for Atari games (DeepMind, 2013)

AlphaGo (Google DeepMind, 2016)

What will we be covering?

- Finite state machines
- Behaviour trees
- Game theory
- Planning
- Utility-based AI
- Game tree search
- Procedural content generation
- Multi-agent systems
- Pathfinding and navigation
- Evolutionary algorithms
- Artificial neural networks

Remember: proposal due next week!