1. Attack target scoring function:

\[ \text{Score}_{\text{AT}} = (D_e \cdot p_1) - (H_{\text{P}} \cdot p_2) + (I_{\text{P}} \cdot p_3) \]

2. Changing the Controller’s parameters

The Controller issues specific commands to each unit, trying to optimise the army performance (micro-management).

We implemented and tested the solution in a classic RTS game StarCraft: Brood War, which was accessed using BWMirror and BWAPI.

3. Genetic Algorithm

Genotype:

\[ P_0, P_1, P_2, P_3, P_4, P_5, P_6, P_7 \]

Fitness (calculated at the end of the game):

\[ \text{Score} = \sum_{i=1}^{m} \text{HP}_i - \sum_{i=1}^{n} \text{H}_i \]

Roulette Wheel Selection (with slight elitism), Uniform Cross-over and Uniform Mutation (10% chance) were used in our GA (population of 32 individuals).

Results:

3 scenarios with different types of enemy units were chosen for the training.

Our results were compared to the built-in AI in StarCraft and UI Alberta bot.

Interesting behavioral patterns emerged for each used scenario. Link to video.

KEY REFERENCES