Artificial Intelligence 1
Kalah Tournament WS 2020/21

Tom Wiesing

26. January 2021

Tournament Overview

▶ Tournament ran in several rounds (1 qualifier + 7 regular rounds + 1 extra round)
▶ A "Round" consisted of each player playing every other place twice
  ▶ A vs B and B vs A (Eliminate any potential advantage to the starting player)

Tournament Overview

▶ Tournament ran in several rounds (1 qualifier + 7 regular rounds + 1 extra round)
▶ A "Round" consisted of each player playing every other place twice
  ▶ A vs B and B vs A (Eliminate any potential advantage to the starting player)
▶ Each round was parametrized by difficulty $D = (H, S)$
  ▶ $H \mathrel{\widehat{=}}$ number of houses, $S \mathrel{\widehat{=}}$ number of seeds
  ▶ Started at $(4, 4)$
  ▶ Gradually increased to $(12, 20)$ for the finale

Tournament Overview

▶ Tournament ran in several rounds (1 qualifier + 7 regular rounds + 1 extra round)

▶ A "Round" consisted of each player playing every other place twice
  ▶ A vs B and B vs A (Eliminate any potential advantage to the starting player)

▶ Each round was parametrized by difficulty $D = (H, S)$
  ▶ $H \; \widehat{=}$ number of houses, $S \; \widehat{=}$ number of seeds
  ▶ Started at $(4, 4)$
  ▶ Gradually increased to $(12, 20)$ for the finale

▶ Players were assigned points for each game
  ▶ Winning agents received $2 * H$ points
  ▶ Agents tied with others each received H points
  ▶ Losing agents received 0 points
  ▶ Note: The scaling factor of H exists for historical reasons and could be ignored

Tournament Overview

- Tournament ran in several rounds (1 qualifier + 7 regular rounds + 1 extra round)
- A "Round" consisted of each player playing every other place twice
  - A vs B and B vs A (Eliminate any potential advantage to the starting player)
- Each round was parametrized by difficulty $D = (H, S)$
  - $H \widehat{=}$ number of houses, $S \widehat{=}$ number of seeds
  - Started at $(4, 4)$
  - Gradually increased to $(12, 20)$ for the finale
- Players were assigned points for each game
  - Winning agents received $2 * H$ points
  - Agents tied with others each received H points
  - Losing agents received 0 points
  - Note: The scaling factor of H exists for historical reasons and could be ignored
- Initialization Time was 10 seconds, Time per Move was 5 seconds
- Invalid Moves / Exceptions were replaced by a random (valid) move

Tournament Results: Qualifiers

- ▶ Round 0 "Qualifiers" with $D = (4, 4)$ (January 14th)
  - ▶ Everyone played repeatedly against a random player.   (check well-behavedness)
  - ▶ Two Agents did not compile properly.
  - ▶ Teams were each given about a day to fix their agents. Both teams did.
- ▶ Received 26 student submissions $+ 1$ from a tutor   (tutor ignored when giving bonus points)
- ▶ This round took the longest, because it included importing the code right.
  - ▶ A couple of agents produced a lot of "log spam" and this code was disabled.
  - ▶ Several agents were not in the right namespace, and this was fixed.
  - ▶ Two agents were named identically or confusingly.   ("Agent007", "Agent Smith" vs "AgentSmith")
  - ▶ Several helper classes were named identically, these were also renamed.
- ▶ Everyone who passed this round got 100 points for the assignment.

- Round 1 with $D = (4, 4)$ (January 15th)
  - 27 agents played, 12 agents passed
  - The cutoff was at 200 points

Tournament Results: Rounds 1 - 5

- Round 1 with $D = (4, 4)$
  - 27 agents played, 12 agents passed
  - The cutoff was at 200 points
- Round 2 with $D = (5, 5)$
  - 12 agents played, the goal was to disqualify 2
  - Second-to-last place was a tie $\rightsquigarrow$ only one agent did not move on
  - 11 agents passed

Tournament Results: Rounds 1 - 5

- Round 1 with $D = (4, 4)$
  - 27 agents played, 12 agents passed
  - The cutoff was at 200 points
- Round 2 with $D = (5, 5)$
  - 12 agents played, the goal was to disqualify 2
  - Second-to-last place was a tie $\leadsto$ only one agent did not move on
  - 11 agents passed
- Round 3 with $D = (6, 6)$
  - 11 agents played, 3 worst ones were removed
  - 8 agents remaining in tournament

Tournament Results: Rounds 1 - 5

- Round 1 with $D = (4, 4)$ (January 15th)
    - 27 agents played, 12 agents passed
    - The cutoff was at 200 points
- Round 2 with $D = (5, 5)$ (January 18th)
    - 12 agents played, the goal was to disqualify 2
    - Second-to-last place was a tie $\rightsquigarrow$ only one agent did not move on
    - 11 agents passed
- Round 3 with $D = (6, 6)$ (January 18th)
    - 11 agents played, 3 worst ones were removed
    - 8 agents remaining in tournament
- Round 4 with $D = (7, 7)$ (January 19th)
    - 8 agents played in the round, 6 agents moved on

Tournament Results: Rounds 1 - 5

- Round 1 with $D = (4, 4)$
    - 27 agents played, 12 agents passed
    - The cutoff was at 200 points
- Round 2 with $D = (5, 5)$
    - 12 agents played, the goal was to disqualify 2
    - Second-to-last place was a tie $\rightsquigarrow$ only one agent did not move on
    - 11 agents passed
- Round 3 with $D = (6, 6)$
    - 11 agents played, 3 worst ones were removed
    - 8 agents remaining in tournament
- Round 4 with $D = (7, 7)$
    - 8 agents played in the round, 6 agents moved on
- Round 5 with $D = (8, 8)$
    - 6 agents played, 4 agents moved on

▶ Round 6 "Semi-Finals" with $D = (9, 9)$ (January 19th)

   ▶ 4 agents played, second place was a tie

   ▶ need an extra round to determine the finale

Tournament Results: Semi-Finals + Finals

- ▶ Round 6 "Semi-Finals" with $D = (9, 9)$ (January 19th)
  - ▶ 4 agents played, second place was a tie
  - ▶ need an extra round to determine the finale
- ▶ Round 6.5 "Pre-Final" with $D = (10, 10)$ (January 20th)
  - ▶ Agent007 vs. BennoPaulJaro: 140 : 60 (Agent007 wins)
  - ▶ BennoPaulJaro vs. Agent007: 101 : 99 (BennoPaulJaro narrowly wins)
  - ▶ Joint Score: 241 : 200 ↝ Agent007 in the finale

Tournament Results: Semi-Finals + Finals

- Round 6 "Semi-Finals" with $D = (9, 9)$ (January 19th)
  - 4 agents played, second place was a tie
  - need an extra round to determine the finale
- Round 6.5 "Pre-Final" with $D = (10, 10)$ (January 20th)
  - `Agent007` vs. `BennoPaulJaro`: $140 : 60$ (`Agent007` wins)
  - `BennoPaulJaro` vs. `Agent007`: $101 : 99$ (`BennoPaulJaro` narrowly wins)
  - Joint Score: $241 : 200 \rightsquigarrow$ `Agent007` in the finale
- Round 7 "Finals" with $D = (12, 20)$ (January 20th)
  - `Ultrainstincts` vs. `Agent007`: $249 : 231$ (`Ultrainstincts` wins)
  - `Agent007` vs. `Ultrainstincts`: $230 : 241$ (`Ultrainstincts` wins)

Tournament Results: Semi-Finals + Finals

- ▶ Round 6 "Semi-Finals" with $D = (9, 9)$ (January 19th)
  - ▶ 4 agents played, second place was a tie
  - ▶ need an extra round to determine the finale
- ▶ Round 6.5 "Pre-Final" with $D = (10, 10)$ (January 20th)
  - ▶ `Agent007` vs. `BennoPaulJaro`: $140 : 60$ (`Agent007` wins)
  - ▶ `BennoPaulJaro` vs. `Agent007`: $101 : 99$ (`BennoPaulJaro` narrowly wins)
  - ▶ Joint Score: $241 : 200 \rightsquigarrow$ `Agent007` in the finale
- ▶ Round 7 "Finals" with $D = (12, 20)$ (January 20th)
  - ▶ `Ultrainstincts` vs. `Agent007`: $249 : 231$ (`Ultrainstincts` wins)
  - ▶ `Agent007` vs. `Ultrainstincts`: $230 : 241$ (`Ultrainstincts` wins)
- ▶ But: `Ultrainstincts` made an illegal move
  - ▶ On one hand: We felt that winning the tournament should include having a well-behaved agent
  - ▶ On the other hand: `Ultrainstincts` won even with this "handicap"
  - ▶ We decided to declare the finale a tie

Tournament Results: Table

1. `Agent007` (100 bonus points)
1. `Ultrainstincts` (100 bonus points)
2. `BennoPaulJaro` (90 bonus points)
3. `KDestroy` (80 bonus points)
4. `Movie_agent321` (70 bonus points)
5. `UniqueNameForAnAgent` (60 bonus points)
6. `AgentDoubleCheck` (50 bonus points)
7. `Unhuman1InteligentAgent` (40 bonus points)
8. `Angela` (30 bonus points)
9. `AgentSmith` (20 bonus points)
10. `Stein3000` (Tutor-submitted)
11. `SmahrtAgent` (10 bonus points)

▶ Johannes was willing to briefly present the agent

▶ Benno, Paul and Jaro were willing to briefly present their agent

▶ Alex, Christian and Johannes were willing to briefly present their agent

Kalah Tournament: Conclusion

▶ We ran a Kalah tournament in 9 rounds.
  ▶ We briefly presented the results here.
  ▶ We published detailed results in JSON format.
  ▶ `https://gl.kwarc.info/teaching/AI/-/tree/master/WS2021/Kalah`
▶ Finals resulted in a tie.
▶ Three agents were presented.
▶ We were asked to run a "Pseudo Tournament" with all agents
  ▶ Running on our server right now.
  ▶ Currently at $D = (6, 6)$, but it may take some time to finish. (We check on it about once a day)
  ▶ We will attempt to run each agent through each round.   (No guarantees $D = (12, 20)$ ran out of memory)
  ▶ We will publish results in the forum once finished.
▶ Any Questions, Comments or Concerns?