Review of "AI-1 Systems Project Report: Play FAUhalma : A variant of Sternhalma"

February 28, 2024

1 Summary

The author explores the possibilities of Search algorithms in board games, specifically FAUhalma. In the report game's rules and the technical background of the proposed solution are presented in a very detailed way. Although the explanation of the non-rectangular board representation does not seem sufficient to me, the author supports the reader with a lot of visuals and a detailed explanation of the examples from the game. A clear representation of the algorithm gives a good general understanding of the gameplay but unfortunately lacks a detailed explanation of the heuristics applied. According to the author's results evaluation, the adversarial search outperforms the greedy search in both 2-player and 3-player game scenarios. However, this statement was not supported by a real example using metrics from the server.

2 Critical evaluation

I really like the Introduction and Abstract sections in the first chapter of the report. However, I think they could be improved with a few small corrections: 1) Skipping the player's main objective mentioned in the abstract, it is better to focus on your contributions to solving the game (uniqueness of your approach). 2) Adding references to the Introduction section to support your thoughts. 3) I believe that the Overview subsection could be more transparent and light, by removing repeating sentences, i.e. "there are several sub-sections... spans over multiple sections and subsections".

In Problem Description Chapter (2) I liked that the problem statement was well motivated by the figures attached. I believe that the coordinate system subsection could be supported by an explanation of the author's implementation in the game as it was stated in the report's contribution. 2.3 Subsection is well-written and supported well by custom-created figures, however, I think, that in the text should be references to the assignment sheet.

In the third chapter, I appreciate that the author introduces some terms, that are crucial to further understanding, such as Search (Greedy and Adversarial) as well as the final representation of the designed algorithm. However, in my opinion, it is more important to get the attention of the reader by answering a research question in this chapter. Until the 3.3 subsection, it was not clear to me how exactly the author maximized the player's win (minimum distance and direction and maximizing the probability of a chain hop in the direction of home). I believe this could be described in a few more words after 3.3 instead of describing the technology stack used.

In Chapter 4 unfortunately it was not clear to me why adversarial search would perform better than greedy search as there is only one table (which I assume compares the performance evaluation of the agent using greedy search only).

3 Conclusion

All in all, the report covers the topic pretty well, and the general structure of the report guides the reader seamlessly from problem to solution, supporting the understanding with visuals and definitions.

However, making a report more detailed in methodology and evaluation chapters with more focus on the research question and contributions rather than technical details of the implementation would make the report even stronger, more robust, and attractive.

4 Technical notes to the author

I would not use a list of tables and figures, as there are not many of them in the report.

A rather small suggestion: changing the name for 2.3 to "Allowed moves in the game" or anything different to your preference would more clearly state the difference between Subsections 2.3 and 2.4.