Date of acceptance	Grade
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Machine Learning Strategies in Cribbage

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1 Introduction

I just want to see if unicode characters will appear. Jag måste se om unicodecharacterer funger. minä haluan katsoa kirjain öööö.

Generic introductory stuff giving a sentence or probably a paragraph about each of the sections covered.

2 Literature Review

Overview of the current literature surrounding this topic.

- Research done in cribbage
- Research done in related imperfect information games (e.g. poker)
- Overview on expert witness machine learning
- Any other topic that ends up getting used (Bayesian logic, statistics?)

3 Data and Methods

Walk-through of how I went about researching the topic. (Maybe I should keep a diary or log or something so this isn't half made up at the end.) When all is said and done, include the final "output" graph in some easily viewable format (121-by-121 table of miniature bar graphs, RGB combination in each cell?).

- Creation of framework
- Creation of "expert advisor"
- Training method for listener/combiner
- Initializations for training

4 Findings

What are the final results of the "experiment."

- Where did each initialization family end up going?
- Were they different or did the agent learn a "single" strategy in general?
- All this and more will be answered ... after the break!

5 Discussion

This is the difficult part. What does this part mean? And how does it differ from what I've already covered above in the Findings section.

6 Conclusion

Generic closing remarks and rephrasing of the original introduction again in parting. Because this is a thesis and likely fairly long, "In section X, we covered Y" is probably allowed and not tacky.

References

- ACC URL http://www.cribbage.org/rules.
- BDSS02 Billings, D., Davidson, A., Schaeffer, J. and Szafron, D., The challenge of poker. *Artificial Intelligence*, 134,1-2(2002), pages 201–240.
- BFGL17 Brown, A., Fisher, G., Gilman, S. and Lang, S., Overhead delivery system for transporting products, April 13 2017. URL https://www.google.com/patents/US20170101182. US Patent App. 14/881,217.
- KS02 Kendall, G. and Shaw, S., Investigation of an adaptive cribbage player. International Conference on Computers and Games. Springer, 2002, pages 29–41.
- Martin, P. L., Optimal Expected Values for Cribbage Hands. Ph.D. thesis, Harvey Mudd College, 2000.
- O'Con O'Connor, R., Temporal difference reinforcement learning applied to cribbage. Technical Report, University of California, Berkeley, 2000. URL http://r6.ca/cs486/.
- PMASA06 Ponsen, M., Munoz-Avila, H., Spronck, P. and Aha, D. W., Automatically generating game tactics through evolutionary learning. *AI Magazine*, 27,3(2006), page 75.
- Pon04 Ponsen, M., Improving adaptive game AI with evolutionary learning. Ph.D. thesis, TUDelft, 2004.
- RW11 Rubin, J. and Watson, I., Computer poker: A review. *Artificial Intelligence*, 175,5-6(2011), pages 958–987.

SPSKP06 Spronck, P., Ponsen, M., Sprinkhuizen-Kuyper, I. and Postma, E., Adaptive game ai with dynamic scripting. *Machine Learning*, 63,3(2006), pages 217–248.