The Title of your Report

Anonymous Authors

***Abstract*—A short summary of your project. You should change also the title, but do *not* enter any author names or anything that unnecessarily identifies any of the authors. It is suggested you use a similar structure (sections, etc.) as demonstrated in this document, but you can make the section headings more descriptive if you wish. Of course *you should delete all the text in this template and write your own*! – this text simply provides detailed instructions/hints on how to proceed.**

I. Introduction

Describe what you did. Provide access to your anonymized code[1].

Note that results should be reproducible using the technologies from the labs (i.e., Python, and selecting among Scikit-Learn, OpenAI Gym, TensorFlow, PyGame, ...).

Do not change the formatting (columns, margins, etc). Hint: shared tools like `http://sharelatex.com/` and `http://overleaf.com/` are great tools for collaborating on a multi-author report in latex. If you wish to use Word, base it on the IEEE template[2] and convert to `pdf` for submission.

II. Background and Related Work

Elaborate (in your own words) the background material required to understand your work. It should cover a subset of the topics touched upon in the course. You are encouraged to cite topics in lectures, e.g., structured output prediction in [2], book chapters, e.g., Chapter 9 from [1], or articles from the literature, e.g., [3], [4]. Basically, you should prepare the reader to understand what you are about to present in the following sections. Eq. (1) shows a random equation.

$$\hat{\mathbf{y}} = \underset{\mathbf{y}\in\{0,1\}}{\operatorname{argmax}}\, p(\mathbf{y}|\mathbf{x}) \tag{1}$$

III. The Environment

Describe your environment, either one you adapted/borrowed from somewhere, or designed yourself. Convince the reader that it is an interesting and/or challenging environment (could it potentially have real-world use or is based on real-world data? Or simply to provide an interesting/fun/challenging problem to tackle. In particular you should outline the particular challenges it poses as a RL problem.

IV. The Agent

The agent you designed for your environment. Justify your choice and design and explain briefly how you implemented/configured it. Naturally, if you took a ready-made environment, you should invert relatively much more effort into this section than the previous one.

[1]Our code is available here: http://anonymouslinktoyourcode.zip

[2]https://www.ieee.org/publications_standards/publications/conferences/2014_04_msw_a4_format.doc

V. Results and Discussion

To measure how well the two agents perform in our environment, we use several measurements. We introduce the *Random Agent*, which chooses at every step a random direction. Every match we simulate is on a grid of size 30, with 10 candies on the map and two adversarial agents.

A. Performance of your Agent in your Environment

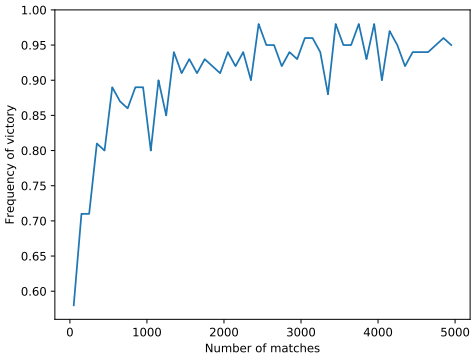

Fig. 1. The learning curve of the RL agent against a random one.

1) Performance of Learning: Show plots, graphs, tables (e.g., Table **??**), etc. You may wish to encourage readers to reproduce results for themselves, e.g., run `runDemo.py` in our source code. Show how your agent performs well, or, if it doesn't perform well, it is better to explain why (this is a result in itself!). In any case, you *must* highlight the weaknesses of your agent as well as its strengths.

TABLE I
Results of the matches.

Match	Minimax	Random
RL	0 - 0	4744 - 113
Minimax	0 - 0	-

B. Performance of your Agent in the ALife Environment

You deploy your agent in the ALife[3] environment (a random screenshot shown in Figure **??**). Does it work well? Why? Why not? Justify the adaptation you think is best.

VI. Conclusion and Future Work

This section summarizes the paper: Your environment and agent, its strength and its weaknesses. Also remark about what would be the next steps you would take if you or someone else

[3]https://github.com/jmread/alife

were to continue/extend this project. Note that for the initial submission you are limited strictly to 4 pages (double column), *not including references*. An extra page will be allowed for final submission (after the initial reviews).

REFERENCES

[1] D. Barber. Bayesian Reasoning and Machine Learning, *Cambridge University Press*, 2012.

[2] J. Read. Lecture III - Structured Output Prediction and Search. *INF581 Advanced Topics in Artificial Intelligence*, 2018.

[3] D. Mena et al. A family of admissible heuristics for A* to perform inference in probabilistic classifier chains. *Machine Learning*, vol. 106, no. 1, pp 143-169, 2017.

[4] O. Vinyals et al. StarCraft II: A New Challenge for Reinforcement Learning. https://arxiv.org/abs/1708.04782, 2017.