Monte-Carlo Tree Search for Robocode

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***Abstract*— The abstract goes here. Please try to make it less than 150 words. We suggest that you read this document carefully before you begin preparing your manuscript.**

This template is for LaTeX users of the Advanced AI in games class. Authors should use this sample paper as a guide in the production of their report(s).

I. Introduction

Most games attempt to engage the player by presenting a number of challenges for the player to overcome. Sometimes these challenges consist of precision, timing, execution speed and reaction time, while in other cases the challenge consists of making a strategic choice. When a player must make a

What problem are you trying to solve? Why is this important?[1]

II. Background

Has this been done before? How? If not, whats the closest related research? (Both using similar approaches and other algorithms.) Whats novel with your research?

III. Game Mechanics

How does the game work that you are using? Why do you need AI in this game?

IV. Methods

How does your algorithm work? Describe in as much detail as you can fit into the report. Also, how did you interface it to the game?

V. Results

Did it work? How well? Provide some figures, and a table or two. How much time does it take? Remember to include significance values (remember the t-test?), variance bars Reread some of the papers from class and compare how they report their results.

The main results and findings go here.

Do not number an equation if it will not be directly cited in the report. In order to avoid numbered equations, use \begin{equation*}–\end{equation*}, \[–\], or $$–$$. For example:

$$a = b + c,$$

$$\dot{x} = f(x, u) + g(x, u),$$

or

$$\ddot{s} = G(s, t)$$

where f, g, and G are functions.

Note that Equation (1) below is numbered! It is produced using \begin{equation}–\end{equation}:

$$F_i(P_i) = a_i + b_i P_i + c_i P_i^2 \tag{1}$$

where a_i, b_i, and c_i are coefficients of unit i, and P_i represents some value for unit i.

Aligning equations can be done with either the align or eqnarray commands. Recently, \begin{align}–\end{align} has gained popularity over \begin{eqnarray}–\end{eqnarray}.

Equation (2) is produced using \begin{align}–\end{align}:

$$\begin{aligned}\dot{x}_l &= \sum_{i=1}^{m} \frac{c_{P_{x_i}} e^{k_{x_i}\bar{x}_i} + c_{N_{x_i}} e^{-k_{x_i}\bar{x}_i}}{e^{k_{x_i}\bar{x}_i} + e^{-k_{x_i}\bar{x}_i}} \\ &\quad + \frac{1}{2}\sum_{j}^{q}(c_{Pu_j} + c_{N_{u_j}}) \\ y &= A_0 + A_1 \tanh(K_x\bar{x}) + B\tanh(K_u\bar{u}) \\ &= F(x),\end{aligned} \tag{2}$$

where $F(x)$ is a function.

Equation (3) represents the same equation produced using \begin{eqnarray}–\end{eqnarray}:

$$\begin{aligned}\dot{x}_l &= \sum_{i=1}^{m} \frac{c_{P_{x_i}} e^{k_{x_i}\bar{x}_i} + c_{N_{x_i}} e^{-k_{x_i}\bar{x}_i}}{e^{k_{x_i}\bar{x}_i} + e^{-k_{x_i}\bar{x}_i}} \\ &\quad + \frac{1}{2}\sum_{j}^{q}(c_{Pu_j} + c_{N_{u_j}}) \\ y &= A_0 + A_1 \tanh(K_x\bar{x}) + B\tanh(K_u\bar{u}) \\ &= F(x),\end{aligned} \tag{3}$$

where $F(x)$ is a function. You get the idea!

A. Example of a Figure

Below is an example of a floating figure using the graphicx package. Note that \label must occur AFTER (or within) \caption. For figures, \caption should occur after the \includegraphics. To reference a figure, use the word Figure followed by the figure number. Here is an example: Figure **??**.

B. Figures and Tables

Please follow the style in this sample paper when generating your figures and tables.

C. Page Limit and Overlength Page Charges

A paper submitted to this conference should be prepared in a single-spaced, two-column format. Its length must be kept to 8 pages or less. In exceptional circumstances, up to two additional pages will be permitted for a charge of AUD$100 per additional page. Table I shows the page limit and page charge schedule.

Another example of a table is shown in Table II.

Citations are included like so [**?**]. Multiple citations appear like this [**?**], [**?**].

TABLE I

PAGE LIMIT

Page limit:	8
Excess page charge:	AUD$100/page

TABLE II

A SECOND TABLE

Method	Mean time	Best time	Mean cost	Maximum cost	Minimum cost
A	928.36	926.20	124793.5	126902.9	123488.3
B	646.16	644.28	124119.4	127245.9	122679.7
C	1056.8	1054.2	123489.7	124356.5	122647.6
D	632.67	630.36	123382.0	125740.6	122624.4

VI. CONCLUSIONS

The conclusion goes here.

What are the strengths and shortcomings of your method? Why did you choose method X instead of Y? How well would it generalize to other game genres? How would you develop it further, if you had time?

APPENDIX

Put your appendix here if you have any.

REFERENCES

[1] J. Orkin, "Three States and a Plan: The A.I. of F.E.A.R." *Monolith Productions / M.I.T. Media Lab, Cognitive Machines Group*, 2006, [Online; accessed December 8, 2014]. [Online]. Available: http://alumni.media.mit.edu/ jorkin/gdc2006_orkin_jeff_fear.pdf