Your Title Goes Here (It Can Be Really Really Really Really Long)

Your Name Here

Abstract

A nice abstract goes here.

Acknowledgments

Some acknowledgments go here.

Your Title Goes Here (It Can Be Really Really Really Really Long)

Your Name Here

A departmental senior thesis submitted to the
Department of Computer Science at Trinity University
in partial fulfillment of the requirements for graduation
with departmental honors.

April 1, 2005

______________________________ ______________________________

Thesis Advisor Department Chair

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Associate Vice President
for
Academic Affairs

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Chapter 1

Example chapter

Example chapter, with apologies to Alex Kolliopoulos, from whose thesis the examples of math and tables were borrowed.

1.1 Examples of figures and tables

This section contains some words, plus Figure 1.1 and Table 1.1.

words, words,

words, words,

1.2 Examples of math

This section contains some math. First, here's a set of equations.

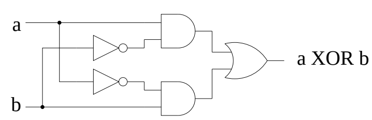

Figure 1.1: An example figure.

Trial 1	Expanding a node to select a child
Trial 3	Selecting a node near the middle of a long, linear list
Trial 4	Selecting a node near the top of a long, linear list
Trial 5	Selecting a node near the bottom of a long, linear list
Trial 6	Scrolling and expanding folders in a large tree
Trial 7	Finding a node deep and near the bottom in a large tree
Trial 8	Finding a node near the top of a large tree

Table 1.1: Purposes of each experimental trial.

$$
\begin{aligned}
y_p &= \frac{y}{\sqrt{y^2 + a^2}}, \\
y_p^2 &= \frac{y^2}{y^2 + a^2}, \\
y_p^2 &= \frac{y^2 + a^2 - a^2}{y^2 + a^2}, \\
y_p^2 &= 1 - \frac{a^2}{y^2 + a^2}, \\
y_p^2 - 1 &= -\frac{a^2}{y^2 + a^2}, \\
1 - y_p^2 &= \frac{a^2}{y^2 + a^2}.
\end{aligned}
$$

words, words,

Now here's a numbered equation.

$$0 = 0 \tag{1.1}$$

1.3 Examples of references

Section 1.1 contains Figure 1.1 and Table 1.1. Section 1.2 contains Equation (1.1). The sample bibliography file contains references to a book [**?**] and a Web site [**?**], plus some other things.

Chapter 2

Partially Observable Environments

2.1 Introduction

Until now, both the GTGR and GTGRD models have given the observer full knowledge of the adversary's state for the entirety of the game. In real-world environments, observers may not have perfect information regarding the states and actions of an adversary.

To accommodate for scenarios with incomplete information for the adversary, we introduce a partially observable variant of the GTGR scenario. In partially observable scenarios, the rules of the game remain largely unchanged, except for addition of shadow states." The observer can not discern the current state of the adversary, while the adversary occupies a shadow state. When the adversary enters an observable portion of the graph, the observer will become aware of the adversary's position once more.

Figure 2.1 illustrates a partially observable environment. Visible states, in which the observer can see the adversary white. Shadow states, in which the adversary is hidden from the observer, are black. The agent starts the game in state S. When the adversary moves to states 4 ,5, 6, or 7, the observer is unable to determine their position until the adversary

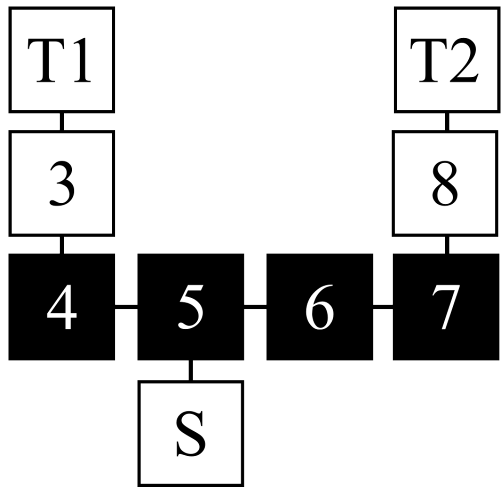

Figure 2.1: A partially observable graph.

re-enters a visible portion of the graph. We will examine two solutions to the partially observable model, both of which involving linear programming.

2.2 The Whale Method

In the example illustrated in Fig. X2, when the adversary moves to nodes 4, 5, or 7 (the three entrance points to the hidden portion of the graph) the observer will only know that the adversary has entered the state Z1. From the observers point of view, the adversary will remain in Z1 until the adversary moves to nodes, 3, 8, or S, (the three exit points from the hidden portion of the graph). When the adversary enters Z1, the observer knows what states the adversary could possibly occupy without directly observing them. With the fat solution, the observer takes the same action for every turn the adversary spends in a hidden portion of the graph. We can easily modify the linear program to accommodate the fat solution.

$$max_{V,\{f_i(s)\}_{i,s}} \sum_{\theta} P(\theta)V(\theta, s_o) \tag{2}$$

$$V(\theta, s) \leq \sum_{i \in B} r(s, i, j, \theta) f_i(s) + V(\theta, j) \forall \theta \in B, \forall s \mid s \neq \theta, \forall j \in \nu(s) \tag{3}$$

$$V(\theta, s) = 0 \quad \text{when } s = \theta \tag{4}$$

$$\sum_i f_i(s) = 1 \quad \forall s \tag{3}$$

$$f_i(s) \geq 0 \quad \forall s, i \tag{2.1}$$

Appendix A

Example appendix

Here is my code.

```
#include <iostream>
int main(void) {
    cout << "Hello, world!\n";
    return 0;
}
```