

Title of the Document

A thesis submitted
in partial fulfillment for the award of the degree of

Master of Technology

in

Machine Learning and Computing

by

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Certificate

This is to certify that the thesis titled *Title of the Document* submitted by **Shivaprasad Nadagoudr**, to the Indian Institute of Space Science and Technology, Thiruvananthapuram, in partial fulfillment for the award of the degree of **Master of Technology in Machine Learning and Computing** is a bona fide record of the original work carried out by him/her under my supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

Dr. Vineeth B. S.
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Name of Department Head
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Place: Thiruvananthapuram

Date: September 2021

Declaration

I declare that this thesis titled *Title of the Document* submitted in partial fulfillment for the award of the degree of **Master of Technology** in **Machine Learning and Computing** is a record of the original work carried out by me under the supervision of **Dr. Vineeth B. S.**, and has not formed the basis for the award of any degree, diploma, associateship, fellowship, or other titles in this or any other Institution or University of higher learning. In keeping with the ethical practice in reporting scientific information, due acknowledgments have been made wherever the findings of others have been cited.

Place: Thiruvananthapuram

Date: September 2021

Shivaprasad Nadagoudr

(SC20M110)

This thesis is dedicated to . . .

Acknowledgements

I acknowledge . . .

Shivaprasad Nadagoudr

Abstract

Abstract here.

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List of Figures

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List of Algorithms

2.1 Sum of N numbers 2

Abbreviations

GNU	GNU's Not Unix
EMACS	Editor MACroS

Nomenclature

m Mass of the object

c Velocity of light

Chapter 1

Introduction

1.1 The Explore-Exploit Tradeoff

The real-world decision-making processes has a feature that presents uncertainty in the outcome of future decision. So it is difficult for agent(decision-maker), due to uncertainty in the result of a given action, to choose the best next action. Most of the real-world tasks aiming at maximising cumulative outcomes require to make many sequential decisions.

Successful completion of such a task necessitates a basic tension: an decision-maker (agent) must constantly choose between exploiting all known good possibilities and researching unknown but potentially better options. This conflict is known as the explore-exploit trade-off, and it's at the basis of improving decision-making.

The explore-exploit tradeoff can be observed in a variety of natural and artificial systems. Foraging animals in the natural world strive to consume as much food as possible while also seeking out the most rewarding foraging areas [1].

1.2 Multi-Armed Bandit Problem

The Multi-armed Bandit (MAB) problem is a classic mathematical description of the explore-exploit tradeoff [2]. A decision-maker(agent) is faced with a sequential series of decisions in the MAB problem. Each choice requires the decision-maker(agent) to pick between two or more options, often known as arms, each of which has a probability distribution associated with it that models the reward. The decision-maker receives a noisy reward chosen from the related probability distribution after selecting an option. The goal of the decision-maker is to maximise their expected cumulative reward, which is comparable to selecting the option with the highest mean as often as possible.

Chapter 2

Introduction

Sample code for including figures, tables, algorithms, and citations are listed here.

2.1 Including Figures



Figure 2.1: Sample figure

2.2 Including Algorithms

Algorithm 2.1: Sum of N numbers

```
1  $S = 0$ 
2 for  $i = 1 : N$  do
3    $S = S + i$ 
4 end
5 Output  $S$ 
```

2.3 Including Tables

In this section, Table 2.1 is explained.

Table 2.1: Sample table

Parameter	x	y
ABC	2	4
DEF	3	9

2.4 Theorem, Proof, Lemma, Corollary, Proposition, and Conjecture

Theorem 2.1. *This is my first theorem.*

Proof. This is my proof. □

Lemma 2.1. *This is a content for sample lemma.*

Corollary 2.1. *This is a sample corollary.*

Proposition 2.1. *This is an example of proposition.*

Conjecture 2.1. *This is an example of conjecture*

2.5 Definition, Condition, Assumptions, Examples, and Problems

Definition 2.1. An example of a definition.

Condition 2.1. An example of a condition.

Assumption 2.1. You assumptions can be placed here.

Example 2.1. This is an example.

Problem 2.1. Problem statements can be put here.

2.6 Remarks, Claims, and Notes

Remark 2.1. Your remarks can be written using this environment.

Claim 2.1. Claims can be made using claim environment.

Note. An example note.

2.7 Citations

Sample citation [3].

2.8 Indexing

L^AT_EX is a type setting system written in T_EX language. L^AT_EX is a free software originally developed by Leslie Lamport in 1980s.

Chapter 3

Related Work

Write related work here.

3.1 Summary

Chapter 4

Conclusions

Conclusions here.

Bibliography

- [1] T. Keasar, E. Rashkovich, D. Cohen, and A. Shmida, “Bees in two-armed bandit situations: Foraging choices and possible decision mechanisms,” *Behavioral Ecology*, vol. 13, pp. 757–765, 11 2002.
- [2] H. Robbins, “Some aspects of the sequential design of experiments,” *Bulletin of the American Mathematical Society*, vol. 58, pp. 527–535, 1952.
- [3] L. Lamport, *LATEX: a document preparation system: user’s guide and reference manual*. Addison-wesley, 1994.

List of Publications

Refereed Journals

1. Journal 1
2. Journal 2

Refereed Conferences

1. Conference 1
2. Conference 2

Others

Appendix A

Appendix A Title

A.1 Section 1

Data for Appendix A.1 here

A.2 Section 2

Data for Appendix A.2 here

Appendix B

Appendix B Title

B.1 Section 1

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