

Title of project placed here

Kurt Portelli

School of Computing Science Sir Alwyn Williams Building University of Glasgow G12 8QQ

A dissertation presented in part fulfilment of the requirements of the Degree of Master of Science at The University of Glasgow

June 25, 2016



abstract goes here

Education Use Consent

I hereby give my permission for this project to be shown to other University of Glasgow students and to be distributed in an electronic format. Please note that you are under no obligation to sign this declaration, but doing so would help future students.

Name: <u>Kurt Portelli</u> Signature: <u>K.Portelli</u>

Acknowledgements

acknowledgements go here

Contents

1	Intr	oduction	5
	1.1	Problem Synopsis	5
	1.2	Project Aims	5
	1.3	Document Outline	5
2	Prel	iminaries	6
	2.1	On-line Algorithms	6
		2.1.1 K-Means	6
		2.1.2 Adaptive Resonance Theory	6
		2.1.3 Mean and Variance	6
		2.1.4 Multivariate Stochastic Gradient Descent	6
	2.2	Probability Distribution Function	6
	2.3	Normalization	6
	2.4	K Nearest Neighbours	6
3	Lite	rature Review	7
4	Con	tributions	8
	4.1	Network Efficiency	8
	4.2	Ensemble Learning	8
	43	Ontimal Stonning	Q

5	Desi	gn and Implementation	9
	5.1	Network Architecture	9
	5.2	Query Analytics	9
6	Eval	uation and Case Study	10
	6.1	Data Set	10
	6.2	Error Allowance vs Messages Sent	10
	6.3	Probability Distribution Functions	10
	6.4	Query Validation	10
7	Con	clusion	11
	7.1	Achievements	11
	7.2	Future Work	11
	7.3	Final Remarks	11
A	Firs	t appendix	12
	A.1	Section of first appendix	12
В	Seco	ond appendix	13

Introduction

- 1.1 Problem Synopsis
- 1.2 Project Aims
- 1.3 Document Outline

Preliminaries

- 2.1 On-line Algorithms
- **2.1.1** K-Means
- 2.1.2 Adaptive Resonance Theory
- 2.1.3 Mean and Variance
- 2.1.4 Multivariate Stochastic Gradient Descent
- 2.2 Probability Distribution Function
- 2.3 Normalization
- 2.4 K Nearest Neighbours

Literature Review

Contributions

- 4.1 Network Efficiency
- 4.2 Ensemble Learning
- 4.3 Optimal Stopping

Design and Implementation

- 5.1 Network Architecture
- **5.2** Query Analytics

Evaluation and Case Study

- 6.1 Data Set
- **6.2** Error Allowance vs Messages Sent
- **6.3** Probability Distribution Functions
- 6.4 Query Validation

Conclusion

- 7.1 Achievements
- 7.2 Future Work
- 7.3 Final Remarks

Appendix A

First appendix

A.1 Section of first appendix

Appendix B

Second appendix

Bibliography

[1] C. Baier and J.-P. Katoen. Principles of Model Checking. MIT Press, 2008.