



Blockchain Approaches to Machine Learning

some hyped-up tagline

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A dissertation submitted in partial fulfilment of the requirements for the degree of M.Sc. Big-Data & AI.

Statement of Originality

I, the undersigned, declare that this is my own work unless where otherwise acknowledged and referenced.

Candidate Jean-Paul Ebejer

Signed _____

Date May 7, 2018

To The Avengers

You know, for saving the world.

Acknowledgements

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Abstract

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Introduction

Note that you may have multiple `\include` statements here, e.g. one for each subsection.

1.1 Motivation

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

A beautiful table is shown in Table 1.1, data from Ebejer et al. [2012] (when citing as part of text, otherwise [Ebejer et al., 2012]).

1.2 Aims and Objectives

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this

		$w = 8$			$w = 16$		
		$t = 0$	$t = 1$	$t = 2$	$t = 0$	$t = 1$	$t = 2$
$dir = 1$							
	c	0.0790	0.1692	0.2945	0.3670	0.7187	3.1815
	c	-0.8651	50.0476	5.9384	-9.0714	297.0923	46.2143
	c	124.2756	-50.9612	-14.2721	128.2265	-630.5455	-381.0930
$dir = 0$							
	c	0.0357	1.2473	0.2119	0.3593	-0.2755	2.1764
	c	-17.9048	-37.1111	8.8591	-30.7381	-9.5952	-3.0000
	c	105.5518	232.1160	-94.7351	100.2497	141.2778	-259.7326

Table 1.1: A Beautiful and Complex Table

text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

A test figure is shown in Figure 1.1.

1.3 Proposed Solution

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Figure 1.1: A test figure.

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Two figures shown side by side are shown in Figure 1.2. Note the use of the *subfig* package (*subfigure* is outdated).

1.4 Document Structure

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this



(a) Goku



(b) More Goku

Figure 1.2: The same super saiyan. Two times.

text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

Background & Literature Overview

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

2.1 Background

In this section you need to explain all the theory required to understand your dissertation (i.e. the following chapters)

Genetic Algorithms

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the

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Performance Measures

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

2.2 Literature Overview

In this section you need to explain (and reference) similar work in literature. Make sure to:

- Give a systematic overview of papers with related/similar work
- Highlight similarities/differences to your work (perhaps in the form of a table)

Some referenced text, as an example [Ebejer et al., 2016; Withers-Martinez et al., 2012].

Materials & Methods

This section should include a recipe of what you did (explain what you have done so if someone wants to reproduce the experiment, they can). A flow chart is typically helpful. Also, make sure to define all software that you used including version numbers and OS. Should also include a description of statistical methods used (if any).¹

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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¹For more information see: <http://rc.rcjournal.com/content/49/10/1229.short>

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And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Results & Discussion

Should include a reiteration of the experiments, and their outcome. Together with a description (discussion). Preamble should include a reminder of the aims and objectives together with a list of experiments to achieve these. Should include many charts and other visualization with appropriate descriptions.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Evaluation

In an ideal world, you should have two kind of evaluations. The first is against some ground truth (perhaps a random model?). The second kind of evaluation is against other people's work (accuracy, speed, etc.). Any dimension which is of interest, should be evaluated. Evaluation should be statistically sound.

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Conclusions

This section should have a summary of the whole project. The original aims and objective and whether these have been met should be discussed. It should include a section with a critique and a list of limitations of your proposed solutions. Future work should be described, and this should not be marginal or silly (e.g. add machine learning models). It is always good to end on a positive note (i.e. 'Final Remarks').

6.1 Aims and Objectives Achieved

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6.2 Critique and Limitations

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6.3 Future Work

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6.4 Final Remarks

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User Manual

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Installation Instructions

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References

- Jean-Paul Ebejer, Garrett M. Morris, and Charlotte M. Deane. Freely available conformer generation methods: How good are they? *J. Chem. Inf. Model.*, 52(5):1146–1158, 2012.
- Jean-Paul Ebejer, Michael H. Charlton, and Paul W. Finn. Are the physicochemical properties of antibacterial compounds really different from other drugs? *Journal of Cheminformatics*, 8(1), June 2016. doi: 10.1186/s13321-016-0143-5.
- Chrislaine Withers-Martinez, Catherine Suarez, Simone Fulle, Samir Kher, Maria Penzo, Jean-Paul Ebejer, Kostas Koussis, Fiona Hackett, Aigars Jirgensons, Paul Finn, and Michael J. Blackman. Plasmodium subtilisin-like protease 1 (SUB1): Insights into the active-site structure, specificity and function of a pan-malaria drug target. *International Journal for Parasitology*, 42(6):597–612, 2012. ISSN 0020-7519.