**Reinforcement Learning approaches for penetration testing.**

Table of Contents

[Declaration i](#_Toc95842141)

[Dedication ii](#_Toc95842142)

[Acknowledgements iii](#_Toc95842143)

[Table of Contents 1](#_Toc95842144)

[List of Figures 3](#_Toc95842145)

[List of Tables 4](#_Toc95842146)

[List of Abbreviations 5](#_Toc95842147)

[List of Symbols 6](#_Toc95842148)

[Title of Paper 7](#_Toc95842149)

[I. Introduction 7](#_Toc95842150)

[Background 7](#_Toc95842151)

[Aim of Research 7](#_Toc95842152)

[Structure of Paper 7](#_Toc95842153)

[II. Approach 7](#_Toc95842154)

[III. Experiments / Testing / Measurements / Data 7](#_Toc95842155)

[IV. Analysis and Discussion of Results 7](#_Toc95842156)

[V. Conclusions 7](#_Toc95842157)

[VI. Future Work 7](#_Toc95842158)

[VII. Instructions 7](#_Toc95842159)

[Formatting 7](#_Toc95842160)

[Title 7](#_Toc95842161)

[Headings 7](#_Toc95842162)

[Detailed instructions 7](#_Toc95842163)

[Indicative Length 7](#_Toc95842164)

[Use of colour 7](#_Toc95842165)

[Figures and Tables 8](#_Toc95842166)

[References 8](#_Toc95842167)

[Remove additional information 8](#_Toc95842168)

[Appendix A: Literature Review 9](#_Toc95842169)

[Introduction of Literature Review 9](#_Toc95842170)

[Body of Literature Review 9](#_Toc95842171)

[Conclusions from the Literature Review 9](#_Toc95842172)

[References of the Literature Review 9](#_Toc95842173)

[Indicative Length of Appendix A: Literature Review 10](#_Toc95842174)

[Appendix B: Data and Programs Used for this Report 11](#_Toc95842175)

[Required 11](#_Toc95842176)

[Optional 11](#_Toc95842177)

[Appendix C: Figures 12](#_Toc95842178)

[Appendix D: Tables 13](#_Toc95842179)

[References 14](#_Toc95842180)

List of Figures

*(required, include page numbers)[[1]](#footnote-1)*

Figure 1, Title of Figure #

List of Tables

*(required if you use tables, include page numbers)[[2]](#footnote-2)*

Table 1, Title of Table #

List of Abbreviations

*(required if you use abbreviations)[[3]](#footnote-3)*

List of Symbols

*(required if you use symbols)[[4]](#footnote-4)*

Title of Paper

*Abstract*—Place your abstract here. Define all symbols used in the abstract. Do not cite references in the abstract.

*Keywords*—About four key words or phrases in alphabetical order, separated by commas.

# Introduction

The introduction to your paper should go here. This section usually has the following subheadings.

## Background

## Aim of Research

## Structure of Paper

# Approach

Describe the approach you have taken to do your research

# Experiments / Testing / Measurements / Data

Describe how you have gathered the data for your research

# Analysis and Discussion of Results

Describe here how you have analysed the data and discuss the results. This may be two separate sections.

# Conclusions

Summarise the conclusions of your work in this section.

# Future Work

Outline future work that could be done to further the research. This section is required for Part A students and optional for Part B students.

# Instructions

## Formatting

Do not change the fonts, linespacing or columns of this paper.

## Title

The title of your paper does not need to be the same as the title of your report. If in doubt, discuss with your supervisor(s).

## Headings

The headings above are suggested headings and will be relevant for most topics and fields. You can amend them as needed - discuss this with your supervisor(s).

## Detailed instructions

The format of this paper is based on the JQE format of IEEE. For detailed instructions on how to complete a paper in this format, refer to <http://ieeeauthorcenter.ieee.org/wp-content/uploads/JQE-Template.doc>.

You are allowed to adopt another journal format than the one prescribed here, however, the adopted format must be a print ready format as it must look like a journal publication in your thesis. Free format submissions, where the publisher does the layout are therefore not allowed.

Please note that your first supervisor must agree to the format you adopt, you must strictly adhere to the formatting prescriptions of the journal and you must notify the unit coordinator in writing with the rationale for the change in formatting before submitting the draft thesis.

## Indicative Length

Indicative length for the paper is approximately 20000 words.

## Use of colour

Many papers are only “printed” in black and white, some charge additional fees for printing in colour. You should not use colour for your text or tables. The use of colour for your figures is recommended, however the information must be unambiguous in black and white (use e.g. different line types to differentiate information, not just the colour of the line)

## Figures and Tables

All figures and tables used in this paper must also be included (usually at a larger scale) in Appendix C and Appendix D of this document.

Do not include the figure and table title in the image of the figure or table, type it in text under the figure or above the table. Figures should be abbreviated by Fig. in the title of the figure, followed by a number and text.

## References

All your references should be included in the reference section of this document after the Appendices, including the references used in this paper. Do not include a separate Reference section in this paper (this would double up your references).

It is highly recommended that you used Endnote for all your references. The citation method can be chosen, but only one can be used for this document and must be applied consistently. Discuss with your supervisor(s) and/or the librarian if you need further advice on this.

## Remove additional information

Delete this Instructions section and amend the remainder of the paper as needed. In most cases, you should not change the formatting or font size or types of this section. If in doubt, ask your supervisor(s).

Appendix A: Literature Review

*(required)[[5]](#footnote-5)*

Introduction of Literature Review

* Give an overview of the topic of this literature review
* Describe the organisation of the literature review
  + Chronological
  + thematic (topic or issue)
  + methodological (focusses on the methods)

Body of Literature Review

* Discussion and critical analysis of sources
* Discussion should be organized either chronologically, thematically, or methodologically (see above)

Conclusions from the Literature Review

* Discuss what you have concluded from reviewing the literature so far
* Discuss how this will inform the remainder of the thesis. How will this proceed?

References of the Literature Review

* To be able to write a journal paper, the literature review would normally require 50 – 100 papers.
* It is highly recommended that you use EndNote to create your list of references

Indicative Length of Appendix A: Literature Review

The indicative length for this appendix is 6000 words.

Appendix B: Data and Programs Used for this Report[[6]](#footnote-6)

*(required section and optional section)*

Required

To ensure that research outcomes can be validated:

* all data and/or programs which you created and/or gathered and used for the results presented in this document must be submitted;
* a softcopy of the data and/or programs must also be provided;
* if the individual file size exceeds 500 MB, please contact the Unit Coordinator on how to submit your files;
* Ensure that you use logical filenames which directly relate to a section, table or figure number or name of this document.
* If you used data and/or programs from by 3rd parties (e.g. from open access databases), you must include links to all sources used in a separate pdf document. These sources must be freely accessible to your first supervisor;
* All open access sources and databases used must also be referenced in the References section of this document;

Optional

In addition, you may include items in this appendix if that is relevant. If in doubt, please discuss with your supervisor(s).

Appendix C: Figures[[7]](#footnote-7)

*(required)*

Include in this appendix all figures used for the paper section of this document and any additional figures that may be relevant. If in doubt, ask your supervisor(s).

* Figures included in this section should have separate figure numbers from the figures used in the paper section (continue numbering your figures throughout this document) and be included in the List of Figures at the start of this document;
* Figures included in this section would normally be at a larger scale than the figures in the paper section;
* Figures should be in colour, however the information must be unambiguous in black and white (use e.g. different line types to differentiate information);
* The title of the figure should not be included in the image, but be typed below the figure;
* The title of the figure should be “Fig.” followed by a number and the text labelling the figure;
* All data and programs which were used to create figures of this document must be submitted in Learnline, refer to Appendix B for further instructions.

Appendix D: Tables[[8]](#footnote-8)

*(required if you use tables in this document)*

Include in this appendix all tables used for the paper section of this document and any additional tables that may be relevant. If in doubt, ask your supervisor(s).

* Tables included in this section should have separate table numbers from the figures used in the paper section (continue numbering your tables throughout this document) and be included in the List of Tables at the start of this document.
* Tables included in this section would normally be at a larger scale than the tables in the paper section;
* Tables should not use colour;
* The title of the table should not be included in the image, but be typed above the table;
* The title of the table should be “Table” followed by a number and the text labelling the table;
* All data and programs which were used to create tables of this document must be submitted in Learnline, refer to Appendix B for further instructions

References[[9]](#footnote-9)

*(required)*

1. List here all figures you have used in the paper and other sections of this document, number all figures, remove this footnote [↑](#footnote-ref-1)
2. List here all tables you have used in the paper and other sections of this document, number all tables, remove this footnote [↑](#footnote-ref-2)
3. List here all abbreviations used in the paper and the other sections of this document, remove this footnote [↑](#footnote-ref-3)
4. List here all variables and their units used in the paper and other sections of this document, remove this footnote [↑](#footnote-ref-4)
5. Amend headings and text as needed, remove this footnote [↑](#footnote-ref-5)
6. Amend headings and text as needed, remove this footnote [↑](#footnote-ref-6)
7. Amend headings and text as needed, remove this footnote [↑](#footnote-ref-7)
8. Amend headings and text as needed, remove this footnote [↑](#footnote-ref-8)
9. It is highly recommended that you use EndNote to make the list of references for this document, remove this footnote [↑](#footnote-ref-9)