

Bio-inspired Computing in R

Deliverable 1: Final Year Dissertation

BSc (Hons) Computer Science

Ryan Porteous

Supervisor: Dr Michael Lones

Second Reader: Dr Katrin Lohan

Declaration of own work

I, Ryan Porteous confirm that this work submitted for assessment is my own and is expressed in my own words. Any uses made within it of the works of other authors in any form (e.g., ideas, equations, figures, text, tables, programs) are properly acknowledged at any point of their use. A list of the references employed is included.

Signed:

Date:

Abstract

R has become the first-choice language for data scientists. However, it is typically not the first choice for people developing and implementing bio-inspired algorithms. Consequently, it can be hard for data scientists to make use of bio-inspired methods. This project will look at the current availability of bio-inspired algorithms in R, identify holes in the provision, and develop a package to fill in one of these holes.

Contents

[1 Introduction 1](#_Toc496563089)

[2 Aims and Motivations 1](#_Toc496563090)

[3 Bio-inspired Computing 1](#_Toc496563091)

[4 Availability of Bio-inspired Algorithms in R 1](#_Toc496563092)

[4.1 Main Areas 1](#_Toc496563093)

[4.2 Areas for Improvement / Areas to be Developed 1](#_Toc496563094)

[5 Chosen Area 1](#_Toc496563095)

[6 Requirements Analysis 1](#_Toc496563096)

[7 Evaluation Strategy 2](#_Toc496563097)

[8 Project Management 2](#_Toc496563098)

[8.1 Project Schedule 2](#_Toc496563099)

[8.1.1 Work Breakdown Structure 2](#_Toc496563100)

[8.1.2 Project Timetable 2](#_Toc496563101)

[8.2 Risk Analysis 2](#_Toc496563102)

[8.2.1 Risk Identification 2](#_Toc496563103)

[8.2.2 Risk Management 2](#_Toc496563104)

[8.3 Professional, Legal, Ethical and Social Issues 2](#_Toc496563105)

[9 References 2](#_Toc496563106)

[10 Appendices 2](#_Toc496563107)

# Introduction

The purpose of this document is to give an overview of the domain of the project; to identify and describe the motivations and objectives of the project; and to give initial plans of how to overcome foreseeable problems. Supporting technical literature relevant to the project domain is also discussed.

# Aims and Motivations

Classical computing methods strengths and weaknesses

Bio inspired computing is a branch of which takes inspiration from nature’s systems and attempts to addresses these weaknesses.

Why use R?

R is the first choice for above question but it’s not first choice for bio-inspired algorithms and that I plan to consider why this is and what’s available

The aims of this project are:

* To identify the availability of bio-inspired algorithms in R
* Identify implementations to be improved/built upon, and areas where no solution exists
* Produce a Package that will be released to improve the availability of bio-inspired tools for R

# Bio-inspired Computing

Give an overview of main areas mentioning main applications of each area

# Availability of Bio-inspired Algorithms in R

## Main Areas

Identify R Packages that provide access to the main areas mentioned in Section 3. Take into account what they do, how they are implemented, if they are still being built upon

## Areas for Improvement / Areas to be Developed

Select areas which can be improved or are absent from the above section giving ways to improve the existing implementations if one exists

# Chosen Area

Reasons as to why I have chosen this area

More in depth look at this areas packages

Main literature review

# Requirements Analysis

# R Packages

## Process of Package Creation

## Packages and Software Tools to Aid in the Process

# Evaluation Strategy

# Project Management

## Project Schedule

### Work Breakdown Structure

### Project Timetable

## Risk Analysis

### Risk Identification

### Risk Management

## Professional, Legal, Ethical and Social Issues

# References

# Appendices