Evolving a Sorting Algorithm with SNGP

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Abstract

Genetic programming (GP) is a technique for creating programmes not by writing them by hand, but instead by creating a population of random programmes and modifying them using an evolutionary algorithm. The desired result is that after several generations a programme that performs well at a given task is generated. GP has previously been used to successfully evolve sorting algorithms.

Single node genetic programming (SNGP) is a variation on GP invented by Dr Jackson which structures the population of programmes in a manner that allows the use of dynamic programming when computing the result of the programmes in an effort to more efficiently generate a working solution.

This project aims to compare the effectiveness of the two methods in evolving a sorting algorithm.

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1 Introduction

This project is being done for my project supervisor Dr David Jackson. The aim of this project is to attempt to evolve a sorting algorithm using SNGP and, if successful, compare the efficiency of evolving sorting algorithms using GP with evolving sorts with SNGP.

2 Background

SNGP was first described by Dr Jackson in A New, Node-Focused Model for Genetic Programming [1].

3 Data Required

4 Design

5 Realisation

6 Evaluation

7 Learning Points

8 Professional Issues

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References

[1] Jackson, D. A new, node-focused model for genetic programming. In *Genetic Programming* (2012), A. Moraglio, S. Silva, K. Krawiec, P. Machado, and C. Cotta, Eds., Lecture Notes in Computer Science, Springer Berlin Heidelberg, pp. 49–60.

10 Appendices