Neuroevolution of Augmenting Topologies

Paul Pauls

Advisor: Michael Adam

CONTENTS

Abstract—Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

I. INTRODUCTION

THIS shall be my introduction. And this shall be my citation [1]. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

II. NEUROEVOLUTION AND EVOLUTIONARY ALGORITHMS

Neuroevolution is a machine learning technique that applies evolutionary algorithms to construct artificial neural networks, taking inspiration from the evolution of biological nervous systems in nature. [2]

An evolutionary algorithm, used in the construction of those artificial neural networks, is a generic population-based optimization algorithms. This population consists of single members which are often algorithms - or neural networks in the case of Neuroevolution - that are trying to solve the problem upon which the evolutionary algorithm is applied to. The evolutionary algorithm then aims to optimize the members of its population by maximizing their result on the *fitness function* upon which all members of the population are judged and usually does so by the means of reproduction, mutation, recombination and selection - mirroring biological evolution.

This algorithmic form of *natural selection* by only letting the most fit algorithms (members) sustain in the population and eradicating the less performant algorithms is a form of maximizing the cumulative reward of the whole population and does therefore classify as the machine learning paradigm of *Reinforcement Learning*.

III. NEUROEVOLUTION OF AUGMENTING TOPOLOGIES (NEAT)

A. ¡Section Introduction¿

B. Key Aspects of NEAT and Differences to Preceding Neuroevolution

C. Performance of NEAT

D. Variants and Advancements of NEAT

IV. APPLICATIONS OF NEAT

V. CONCLUSIONS

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

REFERENCES

[1] Example Cite, *Source*, Apr. 2019. www.example.com
[2] http://www.scholarpedia.org/article/Neuroevolution