

Analyzing the influence of Selection on Genetic Programming's Generalization ability in Symbolic Regression

**A comparison of epsilon-lexicase Selection and
Tournament Selection**

2022-06-29

Introduction

Theoretical Foundations

Experimental Study

Results

Conclusions

Limitations and open Questions

References

Introduction

Research Question

- ▶ Does the usage of ϵ -lexicase parent selection influence the generalization behaviour of genetic programming in symbolic regression if compared to tournament selection?

Genetic Programming

- ▶ A metaheuristic that searches for computer programs that solve a given problem
- ▶ Evolutionary algorithm that simulates the process of Darwinian evolution:
 1. Fitnessfunction: Evaluates the quality of a solution
 2. Selection: Solutions are selected based on their individual fitness
 3. Variation: Mutation and recombination of solutions
- ▶ Unique Features:
 - ▶ Evolve solutions of variable length and structure
 - ▶ Solutions are typically represented by recursive tree structures

Parent Selection

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Symbolic Regression

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Generalization

Motivation

- ▶ Generalization

Theoretical Foundations

Genetic Programming

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Experimental Study

Experimental Study

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Research Design

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Genetic Programming Configuration

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Results

Descriptive Statistics

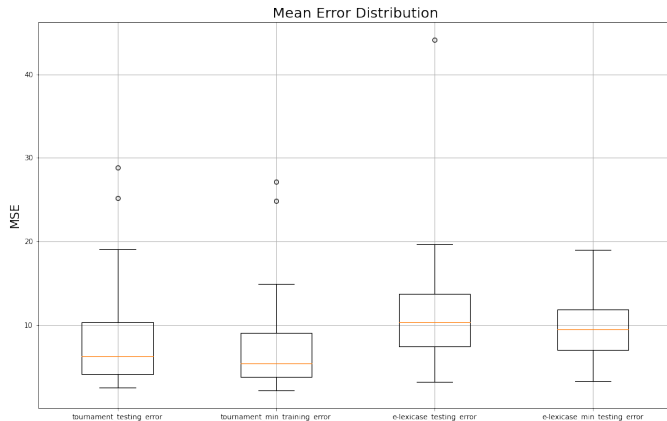


Figure 1: Distribution of Errors

Conclusions

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Limitations and open Questions

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References