**The Effects of Parameter Changes on Comparable Evolutionary Algorithms**

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# Introduction

Set out to find the optimal configuration for an Evolutionary Algorithm (EA), the experiment attempts to understand each argument and its resultant effect on the solution of the fitness. A well-reasoned thought might suggest trying random numbers, and extrapolating tests from initial findings. That is not an efficient solution, nor is it effective. Instead, this experiment focuses on an underlying Meta program which can incrementally test every value in a range, presenting the best results.

The same form of experimentation will be carried out on two different minimisation equations. With the project’s backbone consisting entirely of C++, it would be able to store all the necessary data in relevant object types. This ensures that all tests can be independently explored and processed accordingly.

These results are then plotted graphs using an open-source GUI library, allowing them to be further analysed by an operator. This process helps to develop a deeper understanding on the effects of the parameter changes.

A small portion of the pattern can be observed by first recognising that the solution’s fitness increases with the tournament size. The opposite could be said for both Mutation Rate and the Mutation Height: as these numbers grow, the solution’s fitness shrinks dramatically.

# Experimentation

* Describe the process of making the EA
* Describe the parameters and explain how fitness is calculated
* Describe Meta graphs
  + Describe the effect of tournament size
  + Describe the effect of mutation rate
  + Describe the effect of mutation height
* Explain differences between a good result and an optimal result
* Describe how to calculate a solutions fitness

Evolutionary Algorithms typically begin with a pre-defined set of data to manipulate. Given that the experiment is entirely focused on the effects of the parameters belonging to the EA, using pseudo random genes would be equally acceptable. The next step is feeding these individuals into a tournament selection, where the highest fitness becomes the newest population. Outlines a tournament can pool from a number of individuals, but insists that every individual is given a chance to fight.

# Comparison

# Conclusions