PyGA Documentation

Release 0.1.1

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March 11, 2011

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CHAPTER

ONE

PYGA

This is the core module for pyga.

Here are the basic vanilla components; Gene and a GeneticAlgorithm Other variations are sub-classes of these.

class pyga.**Gene**(*values=(None,)*)

Bases: object

This is the base class for Gene objects. These do not represent a specific gene on one chromosme, rather it representes all possible genes that exist at that position - the different alleles (values).

class pyga.**GeneticAlg**(*populationsize*, *generations*, *genomepattern*, *fitness_function*, *survival=0.10000000000000001*, *rng=None*, *avgmutations=1.0*, *mutationrate=None*)

Bases: object

Base class for the Genetic Algorithm itself.

evol_population()

Evolves a new generation of the population based on the fitness values calculated by score_population.

Replaces self.population with the new generation.

genome_make()

Creates a new genome based on self.chromosomepatterns. Uses the selfs random number generator, which may have been seeded.

Genome return is a tuple of tuples of alleles.

genome_mutate(*genome*)

Returns a mutated copy of a genome. Genome must match self.chromosomepatterns, which it will do if created via self.genomemake or self.genomemutate. Mutation rate is based on self.mutationrate.

This does not do cross-over. This does not do duplication/deletion, and can't unless changes are made to self.chromosomepatterns too.

score_population()

Calculates the fitness of each individual in the population. Then sorts the population in descending fitness order. Ties are broken randomly.

Rather than returning the scores, it sets the self.scores variable This it to discourage repeated fitness calculations becaue it can be a computationally expensive process.

The genomes of the current generation are stored with the scores. This is to make it easy to see which genome got which score, rather than assuming self.population and self.scores have the same ordering.

write_scores(*filename*)

Dumps current generation to disk. Fomat is tab-separated between score and genome.

CHAPTER

TWO

PYGA TESTS

These are the tests and examples that are included with PyGA.

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