Why Estimation Method of Recurrence Time Transition Probabilities with Regard to Genetic Algorithms Without Bit Mutation?

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Abstract

Respecting genetic algorithms without bit mutation, our study is to submit unprecedented algorithm to procure tentative and notional results respecting recurrence time transition probabilities estimation for transient states.

Keywords: Genetic Algorithms without Bit Mutation; Recurrence Time.

1. Introduction

Genetic algorithms without bit mutation as absorbing chains have been proved by El-Nady et al. [1].

Respecting genetic algorithms with bit mutation, estimation method of recurrence time transition probabilities has been proposed by Abou El-Enien [2].

2. The problem Formulation

Proposition 2.1. Respecting each $C = (c_f = t \,|\, c_{f-1} = t) \;\forall\; f \geq 1$

such that $c_0, c_1, c_2, \ldots\ldots$ are outcome functions and t, t are any prospective sequence of transient outcomes (see [3]), we count appeared times number and figure probability.

3. Theorem

Respecting each C, by applying any genetic algorithm without bit mutation then we own probability K, where

$$K = \frac{(c_f = t \,|\, c_{f-1} = t)\, appeared\ \ times\ \ number}{appeared\ \ times\ \ number\ \ of\ \ \ any\ \ state\ \ given\ \ state\ \ t}$$

, and recurrence time transition probabilities for transient states less than one.

4. Theorem proof

1- We clench genetic algorithms without bit mutation on each transient state for r-iterations, where r is a large number.

2- Respecting each C, we count appeared times number and figure probability.

5. The proposed algorithm

By usage MATLAB 7.5, we provided our programs. The submitted name with regard to algorithm is Abou El-Enien Recurrence Time Transition Probabilities Estimation (**Abou El-Enien RTTPE**):

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1. Put in number of bits.

2. Procure unique chromosomes.

3. Put in number of chromosomes.

4. Procure number of states.

5. Produce all possible combinations of unique chromosomes states.

6. Award each state a number.

7. Clench genetic algorithms without bit mutation on each transient state for *r*-iterations.

8. Count respecting each *C* appeared times number.

9. Figure *K* for each *C*.

10. Procure recurrence time transition probabilities.

6. Numerical example

Usage example 6.1 found in [1] for the following function $d(y) = y \cdot \sin(10\Pi \cdot y) + 1, y \in [-1, 2]$

If bits number = 5, chromosomes number = 2 and crossover probability = 0.6, we figure $K(99|99)$ = 0.666666666 for the following chain

(99, 99, 99, 51, 51, 51, 51, 51,....., 51), where *r* = 1000 iterations.

7. Conclusions

The submitted method is Abou El-Enien RTTPE to estimate recurrence time transition probabilities for transient states respecting any Markov Chain, and we own Abou El-Enien RTTPE theorem.

References

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