ERRATA FOR *GA THEORY: PRINCIPLES AND PERSPECTIVES (C. REEVES AND J. E. ROWE)*

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Introduction

This document contains errata for the book *GA Theory: Principles and Perspectives* (1st edition) by Colin Reeves and Jon Rowe, Kluwer Academic Publishers (2003). These errata have been discovered while teaching an Evolutionary Computing course based largely on this book in the Department of Computer Science, University of Bristol. If you know of other errata please let me know.

Chapter 2. Basic Principles

p. 27: the approximation for N is not necessary. An exact solution can be calculated as $N = \lceil 1 - \log_2(1 - P^{1/\ell}) \rceil$.

p. 34: α is not necessarily a positive scalar, as can be seen from its definition on p. 35.

p. 35: The probability of the median chromosome in the population being selected under tournament selection, given as

$$\left(\frac{1}{2}\right)^{\tau-1}, \tag{1}$$

while exact for tournament size $\tau = 2$ is actually an approximation rather than an exact expression. The exact probability is given by

$$\prod_{i=1}^{\tau-1} \frac{\lfloor \frac{N}{2} \rfloor + 1 - i}{N - i}, \tag{2}$$

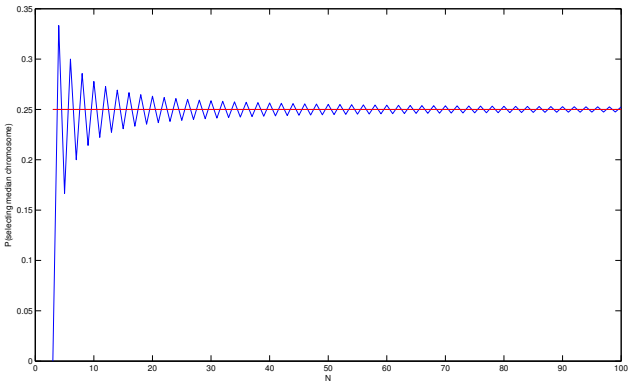
where N is population size. As shown below for $\tau = 3$, equation 1 is a good approximation for equation 2 for large N.

p. 47: fitness $= \infty$ for very isolated chromosomes under the fitness sharing function h. One solution is to add 1 to the expression for ς_j.

Chapter 3. Schema Theory

p. 69: the definition of $P_{\text{diff}}(S, t)$ is misleading. Since one chromosome is always a member of more than one schema (and so is a member of a different schema with probability 1), for lemma 3.2 to hold, $P_{\text{diff}}(S, t)$ should actually be defined as the probability that the other parent is *not a member* of schema S.

p. 85: the fact that $q = 1 - p$ is not explained.



Chapter 5. GAs as Markov Processes

p. 116: the equation for the limiting distribution of $\mathbf{Q}^t$ is incorrect. Actually the transpose of the matrix $(\mathbf{I} - \mathbf{S}^T)^{-1}\mathbf{R}^T$ is required, which simplifies to $\mathbf{R}(\mathbf{I} - \mathbf{S})^{-1}$.

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