

**Errata and Clarifications for Second Printing of  
*Introduction to Stochastic Search and Optimization:  
Estimation, Simulation, and Control*  
by J. C. Spall**

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**CHAPTER 4**

**p. 107, lines 7 – 9 of Condition B.2:**  $\delta(\eta)$  and  $\delta_0$  should be constrained to be strictly positive. Hence the relevant statements should read: “...there exists a  $\delta(\eta) > 0$  such that...” and “...there exists a  $\delta_0 > 0$  such that...”

**CHAPTER 6**

**p. 169, line 9:** The ratio of maximum eigenvalue to minimum eigenvalue is approximately 175, not 65.

**CHAPTER 9**

**p. 251, line 7 of Example 9.4:** The ratio of maximum eigenvalue to minimum eigenvalue is approximately 175, not 65 (same correction appears in Chapter 6, as mentioned above).

**CHAPTER 10**

**p. 270 (paragraphs 2 and 3):** Several modifications to the discussion are required to accommodate the fact that the Markov chain is *not* irreducible (because a GA with elitism cannot move to a population whose best fitness value is lower than the current best value). However, the key conclusion discussed in the current text is unchanged: namely, the chain *does* have a unique limiting value  $\bar{\mathbf{p}}^T$  with  $\sum_{i \in J} \bar{p}_i = 1$  because the GA is always saving the best chromosome encountered.

**CHAPTER 13**

**p. 332:** The third line of eqn. (13.1) should have a minus (not plus) sign at the beginning. Hence the line should read:  $-2[h(\boldsymbol{\theta}, \mathbf{x}) - E(z | \mathbf{x})]E[(z - E(z | \mathbf{x})) | \mathbf{x}]$ . This change does not affect the last (fourth) line of the equation.

**p. 344:** In the fourth line of the second full paragraph, “... $n/n_T$  values for  $MSE(m)$ ...” should be replaced by “...multiple values for  $MSE(m)$ ...”

**p. 353:** The first integral in the second line of the equation at the top of the page should read

$$\int \frac{\partial^2 \log \ell}{\partial \boldsymbol{\theta} \partial \boldsymbol{\theta}^T} \ell \, d\boldsymbol{\zeta}, \text{ not } \int \frac{\partial \log^2 \ell}{\partial \boldsymbol{\theta} \partial \boldsymbol{\theta}^T} \ell \, d\boldsymbol{\zeta}.$$

## CHAPTER 14

**Exercise 14.13 (clarification):** The second sentence should reflect that the diagonals in the covariance matrix are unity (as indicated by the first sentence where the reader is instructed to build on the setting of Exercise 14.12) while the off-diagonals are 0.5. Hence, the second sentence should read: “In the simulated indifference zone selection process, assume that  $\text{cov}[y_k(\boldsymbol{\theta}_i), y_k(\boldsymbol{\theta}_j)] = 0.5$  for all  $k$  and  $i \neq j$ .”

## CHAPTER 15

**pp. 429–430 (clarification to Example 15.7):** Note that  $Q(\theta, V)$  is a sum of a part dependent on  $V$  and a part independent of  $V$  (i.e.,  $Q(\theta, V) = V + b/\theta$ ). In this and other such cases, it is only necessary to apply the sample path averaging based on  $V_0, V_1, \dots, V_{N-1}$  to the part dependent on  $V$ . Hence, (15.16) can be re-expressed as

$$\bar{L}_N(\theta) = \frac{1}{N} \sum_{i=0}^{N-1} V_i \frac{p_V(V_i|\theta)}{p_V(V_i|\theta')} + \frac{b}{\theta},$$

from which the expression for  $\partial \bar{L}_N(\theta)/\partial \theta$  in (15.17) directly follows.

## CHAPTER 16

**p. 440:** The displayed integral should be set equal to 1 as in:  $\int q(\boldsymbol{w} | \boldsymbol{X} = \boldsymbol{x}) d\boldsymbol{w} = 1$ . Further, in the fourth and fifth lines below this displayed integral,  $f(\boldsymbol{x})$  should be  $p(\boldsymbol{x})$  (two instances) and the associated  $\mathbf{0}$  should be 0 (nonbold) since  $p(\boldsymbol{x})$  is a scalar function. Hence, the relevant part of the lines should read: “...of points where  $p(\boldsymbol{x}) \neq 0$ , should be a *superset* of the set of points  $\boldsymbol{x}$  where  $p(\boldsymbol{x}) \neq 0$ .”

## APPENDIX B

**pp. 516–517 (clarification):** The basic one-sample results of Section B.1 are not restricted to only the  $\mu = 0$  case (although this is the case of interest when applying these results to the two-sample setting of interest in Section B.2).