

ERRATA

In "Improved Successive Quadratic Programming Optimization Algorithm for Engineering Design Problems", [AICHE J., 29, 871 (1983)] by M. H. Locke, A. W. Westerberg, and R. H. Edahl:

1. Page 871, Title should read
"An Improved Successive. . ."
2. Page 871, column 2, line 23 should read
"can be set up in the decision variables only."
3. Page 872, column 1, line 17 should read
"yields the following QPP associated with (P2):"
4. Page 872, column 1, lines 20 through 22 should read

$$\begin{aligned} & -(\partial g/\partial x^T)_k^{-1}(\partial g/\partial u^T)_k \Delta u_k \\ & \leq x_{\max} - x_k + (\partial g/\partial x^T)_k^{-1} g(x_k, u_k) \\ & \quad (\partial g/\partial x^T)_k^{-1}(\partial g/\partial u^T)_k \Delta u_k \\ & \leq x_k - x_{\min} - (\partial g/\partial x^T)_k^{-1} g(x_k, u_k) \end{aligned} \quad (P3)$$
5. Page 872, column 1, lines 35 and 36 should read

$$\begin{aligned} & = -(\partial \Phi/\partial x^T)(\partial g/\partial x^T)^{-1} g(x, u) \\ & \quad + \{(\partial \Phi/\partial u^T) - (\partial \Phi/\partial x^T)(\partial g/\partial x^T)^{-1}(\partial g/\partial u^T)\} \Delta u \end{aligned}$$
6. Page 872, column 2, line 1 should read
"the Lagrange of (P4) is:"
7. Page 872, column 2, lines 8-10 should read
"parameter, α :"

Define $\Psi(\alpha)$ as:
 $\Psi(\alpha) = \Phi(u^*, x^*) + \sum \mu_i |g_i(u^*, x^*)|$
8. Page 872, column 2, lines 14 and 15 should read

$$u^* = u_k + \alpha d_k$$

$$x^* = x - \alpha(\partial g/\partial x^T)^{-1}\{g(u_k, x_k) + (\partial g/\partial u^T)_k d_k\}$$

9. Page 872, column 2, lines 24 and 25 should read
"multiplier for the equality constraints of the original problem (P1). λ is calculated by:"
10. Page 872, column 2, line 26 should read

$$\lambda = (\partial g^T/\partial x)^{-1}\{\pi_{\max} - \pi_{\min} - (\partial \Phi/\partial x)\}."$$
11. Page 872, column 2, line 30 should read
"with problem (P2). β_{\max} and β_{\min} are Kuhn-Tucker multipliers"
12. Page 872, column 2, lines 33 and 34 should read
"value of α used is the first one found which satisfies $\Psi(\alpha) < \Psi(0)$. Usually α is 1, except perhaps for the first iterations."
13. Page 872, column 2, 4th line from the bottom should read

$$\text{"i) } \gamma_k = (\delta \Phi/\delta u)_k - A_k^T[\pi_{\min} - \pi_{\max}]_{k-1} - \omega_{k-1}"$$
14. Page 872, column 2, bottom line should read

$$\theta = 1, \text{ if } \delta_{k-1}^T \gamma_k \geq .2 \delta_{k-1}^T C_{k-1} \delta_{k-1}"$$
15. Page 873, column 1, line 13 should read
"Step 4: Compute Step Size Parameter, α_k "
16. Page 873, column 1, line 21 should read
"iv) Select $\alpha_k \in [0, 1]$ such that $\Psi(x^*, u^*, \mu_k) < \Psi(x_k, u_k, \mu_k)$ where"
17. Page 873, column 1, lines 25-27 should read

$$x^* = x_k - \alpha_k P_k$$

$$u^* = u_k + \alpha_k d_k$$

v) Set $x_k = x^*$; $u_k = u^*$; $\delta_k = \alpha_k d_k$ "
18. Page 873, column 2, line 7 should read

(Continued on page 352)

"Throughout the calculations variables Φ and α were pivoted"

19. Page 873, column 2, line 10 should read

"set $\mu_0 = 0$, and $C_1 = I$."

20. Page 873, column 2, lines 12-14 should read

$$\begin{array}{ccccc} & a & b & c & \Phi \\ g_1 & \begin{bmatrix} 1 & 1 & 1 & 0 \end{bmatrix} \\ g_2 & \begin{bmatrix} 0 & -2 & 1 & 1 \end{bmatrix} \end{array}$$

21. Page 873, column 2, lines 19 and 20 should read

$$\begin{bmatrix} 1 & 1 \\ -2 & 2 \end{bmatrix}$$

22. Page 873, column 2, lines 22 and 23 should read

$$\text{"min}[2 - 1] \begin{bmatrix} \Delta b \\ \Delta c \end{bmatrix} + 1/2[\Delta b \Delta c] \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} \Delta b \\ \Delta c \end{bmatrix}"$$

23. Page 873, column 2, lines 26 and 27 should read

$$\begin{bmatrix} -1 \\ -\infty \end{bmatrix} \leq \begin{bmatrix} 1 & 1 \\ -2 & 1 \end{bmatrix} \begin{bmatrix} \Delta b \\ \Delta c \end{bmatrix} \leq \begin{bmatrix} 0 \\ \infty \end{bmatrix}$$

24. Page 873, column 2, line 30 should read

"The search for α such that $\Psi(\alpha) < \Psi(0)$. Using a step size of

0.25,"

25. Page 873, column 2, line 36 and 37 should read

$$\begin{bmatrix} 5.33 & 2.0 \\ 2.0 & 1.891 \end{bmatrix}$$

26. Page 873, column 2, line 39 should read

"Table 1. Search for α "

27. Page 873, column 2, line 40 should read

" α Φ $\mu^T g$ Ψ "

28. Page 873, column 2, line 47 should read

"Iteration a b RHS Φ "

29. Page 874, column 2, line 6 should read

"Function associated with (P4)"

30. Page 874, column 2, line 14 should read

"bounds on z variables of (P1)"

31. Page 874, column 2, lines 15 and 16 should read

" λ = Lagrange multiplies on equality constraints of (P1)"

32. Page 874, column 2, line 23 should read

"equality constraints of problem (P3)"

33. Page 874, column 2, line 25 should read

"constraints of (P1)"

34. In addition, it is obvious that references made in the text are misprinted, although they are understandable.