Errata for
A Beginner's Course in Boundary Element Methods
Universal Publishers (2007)

Preface

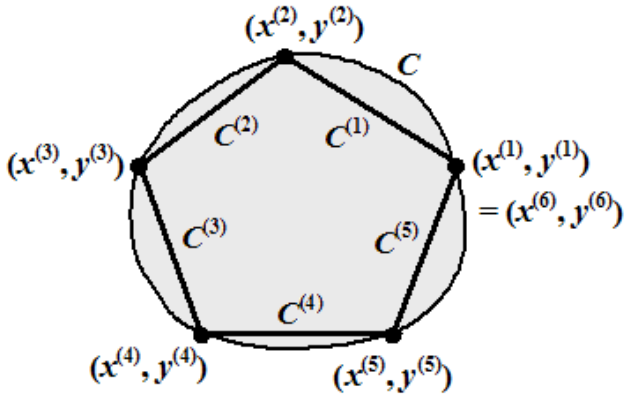
Page i, 2nd paragraph. The sentence "It (the term 'boundary element method') was first used in a 1977 paper by CA Brebbia and J Dominguez" may not be accurate. Professor R Butterfield of the University of Southampton informed me that there is an earlier paper where the term "boundary element method" was used. The paper was presented at a major finite element method conference at the University of Karlsruhe, Germany, in September of 1975. Its details are as follows: P.K. Banerjee and R. Butterfield (1975), Boundary element methods in geomechanics, Chapter 16 in: Finite Element in Geomechanics, Ed. G. Gridehus, John Wiley, Chichester, UK; Proc. NMSRM, University of Karlsruhe, FRG. (14 August 2015)

Page ii, 1st and 4th lines of the footnote. The phrase "An integral equation methods" should be corrected to read "An integral equation method". (11 Dec 2007)

Chapter 1

Page 19, above Eq. (1.25). For clarity, the phrase "The boundary C is approximated as an N-sided polygon ..., that is," may be replaced by "The boundary C is discretized into N very small straight line segments $C^{(1)}$, $C^{(2)}$, $\cdots$, $C^{(N-1)}$ and $C^{(N)}$, that is,". (15 April 2012)

Page 20, Figure 1.4. The point $(x^{(6)}, y^{(6)})$ was incorrectly labelled as equal to $(x^{(5)}, y^{(5)})$. It should be equal to $(x^{(1)}, y^{(1)})$ instead. The corrected figure should be as follows:



(This error was reported by Jackson R. Jones.) (17 July 2010)

Page 38, 2nd line. "$(x^{(m)}, y^{(m)}) = (0, (m-1)\ell)$" should be corrected to read "$(x^{(m)}, y^{(m)}) = ((m-1)\ell, 0)$". (This error reported by Bao-Ing Yun is purely a typographical one and does *not* affect the code on page 38.) (11 Dec 2007)

Page 38, 3rd line. "$(x^{(m+2N_0)}, y^{(m+2N_0)}) = (1-(m-1)\ell, 0)$" should be corrected to read "$(x^{(m+2N_0)}, y^{(m+2N_0)}) = (1-(m-1)\ell, 1)$". (This error reported by Bao-Ing Yun is purely a typographical one and does *not* affect the code on page 38.) (11 Dec 2007)

Page 38, 4th line. "$(x^{(m+3N_0)}, y^{(m+3N_0)}) = (1-(m-1)\ell, 0)$" should be corrected to read "$(x^{(m+3N_0)}, y^{(m+3N_0)}) = (0, 1-(m-1)\ell)$". (This error reported by Bao-Ing Yun is purely a typographical one and does *not* affect the code on page 38.) (11 Dec 2007)

Chapter 3

Page 84, 7th line. In the series definition for $J_0(x)$, $(m!)^m$ should be replaced by $(m!)^2$. (This error reported by Alessandro Vaccari is purely a typographical one and does not affect any other part of the book.) (4 July 2008)

Page 84, 8th line. The definition for $Y_0(x)$ should be corrected to read:

$$Y_0(x) = \frac{2}{\pi}(\ln(\frac{x}{2}) + \gamma)J_0(x) - \frac{2}{\pi}\sum_{m=1}^{\infty}\frac{(-1)^m x^{2m}}{4^m(m!)^2}\sum_{k=1}^{m}\frac{1}{k}.$$

(Note that the expression $\sum_{k=1}^{m}\frac{1}{k}$ is missing in the definition given in the book. This error is purely typographical and does not affect any other part of the book.) (22 May 2009)

Chapter 5

Page 160, 3rd line. The phrase "two-dimensional solution region" should be corrected to read "two-dimensional solution domain". (11 Dec 2007)

Page 168, last line. In equation (5.22), "$x^2+y^2 \to 0$" should be replaced by "$x^2 + y^2 \to \infty$". (11 March 2009) (This error was reported by Joris Vankerschaver.)

Page 197, Problem 7. The phrase "circle" should be corrected to read "circular region", and "$x^2 + y^2 < a$" should be corrected to read "$x^2 + y^2 < a^2$". (11 Dec 2007)

Chapter 6

Page 206, equation (6.26). Not an error, but just a comment. There is nothing wrong with equation (6.26) as it was written on page 206, but I would just like to point out the three separate sets of parametric equations could actually be simply written as just

$$\begin{aligned} X^{(k)}(u,v) &= (x_2^{(k)} - x_1^{(k)})u + (x_3^{(k)} - x_1^{(k)})v + x_1^{(k)}, \\ Y^{(k)}(u,v) &= (y_2^{(k)} - y_1^{(k)})u + (y_3^{(k)} - y_1^{(k)})v + y_1^{(k)}, \\ Z^{(k)}(u,v) &= (z_2^{(k)} - z_1^{(k)})u + (z_3^{(k)} - z_1^{(k)})v + z_1^{(k)}. \end{aligned}$$

What is important here is that the parameters u and v must be as shown in equation (6.25), that is, $0 < u < 1 - v$, $0 < v < 1$, to

esnure that we are describing the appropriate (triangular) portion of the plane containing $(x_1^{(k)}, y_1^{(k)}, z_1^{(k)})$, $(x_2^{(k)}, y_2^{(k)}, z_2^{(k)})$ and $(x_3^{(k)}, y_3^{(k)}, z_3^{(k)})$. (P Kirana Kumara e-mailed to inform me that he obtained numerical results of comparable accuracy using the above parametric equations.) (2 May 2012)

Updated on 14 August 2015 by WT Ang