Errata for the book

Partial Differential Equation in Action
(First edition 2007) by
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N.B. : Negative lines start above the footnotes.

Chapter 1

Page 8, line 1: \( A \) should be \( \mathcal{A} \).
Page 9, line -4: change \( A \) into \( \Omega \).
Page 11, line -2: change “be a \( C^1 \)–” into “be a bounded \( C^1 \)–”
Page 12, line 5: \( |\nabla \varphi (y')| \) should be \( |\nabla \varphi (y')|^2 \)
Page 12, line 10: Change \( \int_{\Omega} \) into \( \int_{\partial \Omega} \).

Chapter 2

Page 24, line 17: “least square” should be “least squares”.
Page 26, line -5: change \( -\sum_{m=1}^{\infty} (u_1 - u_0) \sum_{m=1}^{\infty} \) into \( -\sum_{m=1}^{\infty} (u_1 - u_0) \sum_{m=1}^{\infty} \).
Page 34, line 10: change \( x_1 \in V \) into \( x_1 \in \Omega \) and \( V \) into \( \Omega \).
Page 36, line 10: can should be can q.
Page 36, line 9 and 12: delete q.
Page 46, line -3: the first \( \langle k^2 \rangle \) should be \( \langle k \rangle \).
Page 51, line 5: change \( x_1 \in \Omega \) and \( V \) into \( \Omega \).
Page 58, line 10: change 3 into 4.
Page 68, line -4: change \( u(x,y) \) into \( u(x,t) \).
Page 68, line -1: \( \Gamma \) should be \( \Gamma_D \).
Page 70, line 7: change \( (0, \infty) \) into \( (0,T) \).
Page 87, line 1: change 2.8.3 into 2.2.2.
Page 98, line -3: barriers should be barriers.
Page 101, line 8: change “large enough” into “suitably chosen”.

Chapter 3

Page 103, line 10: \( e^{\iota \alpha z} \) should be \( e^{\iota \alpha z} \).
Page 106, line 2: change \( M_h f \) to \( M_h u \).
Page 108, line 4: change \( \Delta^* \omega \) to \( \Delta^* \omega \).
Page 111, line 4: erase “from”.
Page 114, line 7: change \( -\lambda v(r) \) into \( \lambda v(r) \).
Page 114, line 15: change \( \lambda = m \) into \( \lambda = -m^2 \).
Page 116, line 1 of the footnote 8: change \( R(\cos \varphi, \sin \varphi) \) into \( R(p_1 + \cos \varphi, p_2 + \sin \varphi) \).
Page 124, line 3: \( u_R \) should be \( u \).
Page 125, line -1: \( \omega_{n}^{-1} \) should be \( (n - 2) \omega_{n}^{-1} \).
Page 140, line -10: change \( m \geq 2 \) into \( m \geq 4 \).
Page 140, line -7: \( \partial B_{hm} \) should be \( \partial B_{(m-1)} \).
Page 142, footnote, line -2: \( u_h (\mathbf{x}) \) should be \( u_h (\mathbf{x}, \mathbf{r}) \).
Page 147, line -4, -5: \( B_R \) should be \( \Omega \).
Page 148, line −7: 3.16 should be 3.19.
Page 151, line 11: replace “unit circle” by “circle of radius $R$”.
Page 151, line −7: replace “harmonic $B_1^{++}$” by “harmonic in $B_1^{++}$”.
Page 154, line 3: replace “harmonic $\Omega_e$” by “harmonic in $\Omega_e$”.

Chapter 4

Page 175, lines 8, 11, 14, 19: replace $q''$ by $q'' \circ g$.
Page 176, line 7: replace $q''$ by $q'' \circ g$.
Page 181, Fig. 4.18, caption: change 4.3 into 4.2.
Page 183, Footnote 13: replace “we already have $u_x < 0$” by “we have $u_x \geq \frac{1}{Cl}$”.
Page 185, line −7: change the first $u_-$ into $u_+$.
Page 186, line 7: replace $R$ by $r$.
Page 189, line −9: change $\to 0$ into $\to 0^+$.
Page 191, line −5: erase one of the two (4.67).
Page 192, line 4: replace “$= \int_0^x$” by “$= \frac{2}{\sqrt{\pi}} \int_0^x$.
Page 212, lines 3, 4: add reference number (4.120bis) to the system.
Page 212, line 17: change “system (5.30)” into “system (4.120bis)”.
Page 217, line 6: change $q'$ into $q' \circ g$ and $q''$ into $q'' \circ g$.
Page 218, line 8: change $u(0, x) = H(x)$ into $u(x, 0) = -H(x)$.
Page 218, line 14: replace “$= \int_s^{+\infty}$” by “$= \frac{2}{\sqrt{\pi}} \int_s^{+\infty}$.

Chapter 5

Page 232, lines −6 and −7: replace $1/2L$ by $c/2L$ and $m/2L$ by $mc/2Lm$, respectively.
Page 248, line 2: change $-k$ into $-2k$.
Page 248, lines 22 and 26: change $\tau$ into $\tau_0$.
Page 261, line −1: $J$ should be $J_0$.
Page 261, line 12: change both $n$’s into $k$.
Page 262, line 12: $x_3 \cos$ should be $x_3 = \cos$
Page 270, lines 9 and 12: $b_{mm}$ and $h_{mm}$ should be $b_{mn}$ and $h_{mn}$.
Page 298, line 9: change $u(0-, t)$ and $u(0+, t)$ into $u_x(0-, t)$ and $u_x(0+, t)$, respectively.

Chapter 6

Page 304, line −14: $E(v) = \int_{13} ...$ should be $E(v) = \frac{1}{2} \int_{13} ...$
Page 305, line 22: replace “there is a way” by “it is possible”.
Page 313, line −4: put $\sum_{j=1}^{n} x_j^2$ under square root.
Page 321, line −4: “form” should be “from”.
Page 322, line −4: change $u(-1)$ and $u(1)$ into $|u(-1)|$ and $|u(1)|$, respectively.
Page 348, lines −5, −13, −20: change 6.8 into 6.9, 6.10 into 6.11 and 6.11 into 6.12, resp.
Page 349, line −5: change 6.7 into 6.6.
Page 352, line −6 and page 353, lines −5 and 8: change 6.12 into 6.13.
Page 359, line −5: Replace “Then” by “Then, if dim\(H = \infty\)”. 
Page 359, line −2: erase “If dim\(H = \infty\)” and add after \(\{\lambda_m\}\): “either constitute a finite set or”.
Page 360, line 12: change “theorem 6.12” into “Theorem 6.13”.
Page 360, line 15: change \(a_{\lambda_0} (u, v)\) into \(a_{\lambda_0} (v, v)\).
Page 360, line −12: add at the end: “In particular we can consider \(S_\lambda \in \mathcal{L}(H)\)”.
Page 360, line −4: change 7.4 into 6.15.
Page 360, line −3 change \(\sigma \left(S_{\lambda_0}\right)\) into \(\sigma \left(S_{\lambda_0}\right)\) and “\(\sigma \left(S_{\lambda_0}\right) = \{0\}\)” into “\(\sigma \left(S_{\lambda_0}\right) \\cap \{0\}\)”.

Chapter 7

Page 370, line 3: change \(\Omega\) into \(\mathbb{R}^3\).
Page 373, line 4: change “\(= \int_{\Omega \cap B(0)} \eta_\varepsilon (y) \, dy \leq 1\)” into “\(\leq \int_{B(0)} \eta_\varepsilon (y) \, dy = 1\)”.
Page 374, line 6: “that linear” should be “that a linear”.
Page 389, line 5: \(x_i^n\) should be \(x_i^2\).
Page 395, line 1, and Page 402, line −1, 7.26 should be 7.20.
Page 403, line 10: “identifies” should be “identify”. 
Page 417, line 6: “turn” should be “turns”.
Page 419, line 3 “contained” should be “contained”.
Page 425, line 3: \(\leq \int_0^T \|s_k\...\) should be \(\leq \int_0^T \|s_k\...\).
Page 428, line −1: \(\frac{1}{2\pi}\) should be \(\frac{1}{4\pi}\).
Page 457, line −2: “\(\ldots - fu\)” should be “\(-2fu\)”.

Chapter 8

Page 438, line 10: Proposition 6.6 should be Theorem 6.7.
Page 446, line 8: \(E(u) = \int_\Omega \ldots\) should be \(E(u) = \frac{1}{2} \int_\Omega \ldots\).
Page 446, line −7: change \(a_0\) into \(\gamma_0\).
Page 452, line −10: change “Rayleigh to Rayleigh”.
Page 452, formula (8.42): change “non identically zero” to “\(\neq 0\) a.e.”.
Page 457, line −2: “\(\ldots - fu\)” should be “\(- 2fu\)”.
Page 458, line −1: \(b\) should be \(c\).
Page 463, Remark 8.12: replace all lines 15 to 18 by “However, the boundary integral makes no sense if \(f \in L^2 \Omega; \mathbb{R}^n\) only, since \(\partial\Omega\) has \(n\)-dimensional measure zero.”.
Page 465, line −10 and Page 467, line 5: Change \(\inf_{\Omega} \geq \inf_{\partial \Omega} u^-\) into \(\inf_{\partial \Omega} u\geq \inf_{\partial \Omega} (-u^-)\).
Page 466, line 9: Change \(\inf_{\partial \Omega} u^-\) into \(\inf_{\partial \Omega} (-u^-)\).
Page 466, line −12: 6.12 should be 6.13.
Page 466, line −1: 8.18 should be 8.3.
Page 469, line 11: change “$a_{ij}$ be” into “$a_{ij}$ and $b_j$ be”.
Page 471, In Figure 8.3 change 8.17 into 8.2.
Page 472, In Figure 8.4 change 8.18 into 8.3.
Page 475, line -4: “smooth domain” should be “smooth bounded domain”.
Page 476, line 9: “$u_* \leq g \leq u^*$” should be “$u_* \leq u^*$.”
Page 478, line 12: $w_1$ should be $\sigma w_1.$
Page 480, line -7: Proposition 6.4 should be Theorem 6.7.
Page 482, line 6: replace $p(z - \mathcal{E}[z])$ by $-p\mathcal{E}[z]$.
Page 485, line -7: $1/\sqrt{2}$ should be $4/\sqrt{2}$.
Page 485, Problem 8.4: change $x < 1$ and $u(\pi/4)$ into $x < \pi/6$ and $u(\pi/6)$.
Page 486, Line 2: There is a missing $v$ before $\in$.
Page 486, Line 7: $V$ should be $X$.

Chapter 9
Page 498, line 20: replace both $\int_\Omega$ by $\int_0^T$.
Page 500, formula (9.19): change $\leq \|g\|_2^2$ into $\leq 2\|g\|_0^2$.
Page 503, line 5: replace $-\alpha$ by $\alpha$.
Page 503, line 9: $\|u\|_{L^2(\Omega)}$ should be $\alpha\|u\|_{L^2(\Omega)}$.
Page 504, line 4: replace both $u_m(t)$ by $\dot{u}_m(t)$.
Page 511, formula (9.39): change “$= -u^*$...” into “$= (u^*$...”
Page 513, line -12: $-\frac{\gamma \varepsilon}{2}$ should be $-\frac{\gamma \varepsilon}{2}$.
Page 513, line -6: $\lambda_0 > \gamma$ should be $\lambda_0 > \gamma_0$.
Page 520, line 12: replace “in H” by “in $V$ and $H$, respectively”.
Page 522, line -2: change “$G(t)e^{\gamma t}$” into “$G(t)(e^{\gamma t} - 1)$”.
Page 522, line -1: add: “Thus, $\Psi(t) \leq G(t) + R(t) \leq G(t)e^{\gamma t}.$”
Page 523, lines 3, -11, -9, -3: Replace 2$c^2$ by $c^2$.
Page 523, line 10: replace $c^2$ by $1/2$.
Page 524, line 2: replace $2c^2$ by $c_0^2$.
Page 525, line 2: change “Theorem 9.10 shows” into “Theorems 9.10 and 9.11 show”.
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