

Errata for the book

Partial Differential Equation in Action

(First edition 2007) by
Sandro Salsa

N.B. : Negative lines start above the footnotes.

Chapter 1

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

Chapter 2

- Page 24, line 17: “**leat square**” should be “**least squares**”.
- Page 26, line -5: change $-\sum_{m=1}^{\infty}$ into $-(u_1 - u_0)\sum_{m=1}^{\infty}$.
- Page 34, line 10: change $x_1 \in V$ into $\mathbf{x}_1 \in \Omega$ and \bar{V} into $\bar{\Omega}$.
- Page 36, line 7: ca^n should be ca^nq .
- Page 36, line 9 and 12: delete q .
- Page 46, line -3: the first $\langle k^2 \rangle$ should be $\langle k \rangle$.
- Page 56, line -5: u_{xx} should be c_{xx} .
- Page 58, line 10: change 3 into 4.
- Page 68, line -4: change $u(x, y)$ into $u(x, t)$.
- Page 68, line -1: Γ should be Γ_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: *barrires* should be *barriers*.
- Page 101, line 8: change “large enough” into “suitably chosen”.

Chapter 3

- Page 103, line 10: $e^{i\alpha z}$ should be $e^{\alpha z}$
- Page 106, line 2: change $M_h f$ to $M_h u$.
- Page 108, line 4: change $\Delta^* w_{\Gamma}$ to $\Delta_h^* w_{\Gamma}$.
- 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: ω_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: ∂B_{mr_0} should be $\partial B_{(m-1)r_0}$.
- Page 142, footnote, line -2: $u_h(\mathbf{x})$ should be $u_h(\mathbf{x}, \boldsymbol{\sigma})$.
- Page 147, lines -4, -5: B_R should be Ω .

- 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 Ω_e ” by “harmonic in Ω_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 $u_x \geq \frac{1}{Ct}$ ”.
 Page 185, line -7: change the first u_- into u_+ .
 Page 186, line 7: replace R by r .
 Page 189, line -9: change $\rightarrow 0$ into $\rightarrow 0^+$.
 Page 191, line -5: erase one of the two (4.67).
 Page 192, line 4: replace “ $= \int_0^x$ ” by “ $= \frac{2}{\sqrt{\pi}} \int_0^x \mathbb{J}$ ”.
 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 $u(0, x) = \mathcal{H}(x)$ into $u(x, 0) = -\mathcal{H}(x)$.
 Page 218, line 14: replace “ $= \int_s^{+\infty}$ ” by “ $= \frac{2}{\sqrt{\pi}} \int_s^{+\infty} \mathbb{J}$ ”.

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 τ into τ_0 .
 Page 261, line -1: J should be J_0 .
 Page 261, line 12: change both \mathbf{n}' s into \mathbf{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: $E(v) = \int_{\Omega} \dots$ should be $E(v) = \frac{1}{2} \int_{\Omega} \dots$
 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 345, line -3: change 6.23 into 6.13.
 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 355, lines -2 and -11: change 6.12 into 6.13 and 6.13 into 6.14 resp.
 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 11: replace “theorems 6.13 and 6.14” by “Theorem 6.15”.
 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 $\sigma(S_{\lambda_0})$ into $\sigma_P(S_{\lambda_0})$.
 Page 361, line -3: change $\sigma(S_{\lambda_0})$ into $\sigma_P(S_{\lambda_0})$ and “ $\sigma(S_{\lambda_0}) =$ ” into “ $\sigma(S_{\lambda_0}) \setminus \{0\} =$ ”.
 Page 365, line -15: u_{kj} should be $u_{k,j}$.

Chapter 7

- Page 370, line 3: change Ω into \mathbb{R}^3 .
 Page 373, line 4: change “ $= \int_{\Omega' \cap B_\varepsilon(\mathbf{0})} \eta_\varepsilon(\mathbf{y}) d\mathbf{y} \leq 1$ ” into “ $\leq \int_{B_\varepsilon(\mathbf{0})} \eta_\varepsilon(\mathbf{y}) d\mathbf{y} = 1$ ”.
 Page 374, line 6: “that linear” should be “that a linear”.
 Page 389, line 5: $x_1^{n_n}$ should be $x_1^{\beta_n}$.
 Page 398, line -7, 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 “cotained” should be “contained”.
 Page 425, line 3: $\leq \int_0^T \|s_k\| \dots$ should be $\leq \int_0^T \|s_h\| \dots$.
 Page 428, line -1: $\frac{1}{2\pi}$ should be $\frac{1}{4\pi}$.
 Page 457, line -2: “... - fu” should be “-2fu”.

Chapter 8

- Page 438, line 10: Proposition 6.6 should be Theorem 6.7.
 Page 446, line 8: $E(u) = \int_\Omega \dots$ should be $E(u) = \frac{1}{2} \int_\Omega \dots$
 Page 446, line -7: change a_0 into γ_0 .
 Page 452, line -10: change *Raiyeigh* to *Rayleigh*.
 Page 452, formula (8.42): change “non identically zero” to “ $\neq 0$ a.e.”.
 Page 457, line -2: “... - 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 $\mathbf{f} \in L^2(\Omega; \mathbb{R}^n)$ 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 $\inf_\Omega u \geq \inf_{\partial\Omega} (-u^-)$.
 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 σw_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 10: replace 6.11 by 6.12.
- Page 498, line 20: replace both \int_{Ω} by \int_0^T .
- Page 500, formula (9.19): change $\leq \|g\|_0^2$ into $\leq 2 \|g\|_0^2$.
- Page 503, line 5: replace $-\alpha$ by α .
- Page 503, line 9: $\|u\|_{L^2(0,T;V)}^2$ should be $\alpha \|u\|_{L^2(0,T;V)}^2$.
- Page 504, line 4: replace both $u_m(t)$ by $\dot{u}_m(t)$.
- Page 511, formula (9.39): change “ $= -(u^* \dots)$ ” into “ $= (u^* \dots)$ ”.
- Page 513, line -12: $-\frac{\gamma_0 \varepsilon}{2}$ 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 $2c^2$ by c^2 .
- Page 523, line 10: replace c^2 by $1/2$.
- Page 524, line 2: replace $2c^2$ by c^2 .
- Page 525, line 2: change “Theorem 9.10 shows” into “Theorems 9.10 and 9.11 show”.



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Salsa, S.

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