

Errata for “An Introduction to Infinite-Dimensional Differential Geometry”

The list below collects errata and misprints for the first edition of “An Introduction to Infinite-Dimensional Differential Geometry” published by Cambridge University Press.

Special thanks go to T. Rot, S. Stroppel and T. Nilssen who made me aware of many of the errors compiled below. **Last changes: July 24, 2023**

- p.4 Theorem 1.7: Not strictly an error, but add the following to the last sentence:
..., that is, for each pair $x, y \in E, x \neq y$ there exists a continuous linear $\lambda: E \rightarrow \mathbb{R}$ such that $\lambda(x) \neq \lambda(y)$.
- p.10 proof of 1.20: $E \times F$ instead of $E_1 \times E_2$ and H should be F .
- p.12 proof of Lemma 1.25, line 5: missing t_n^{-1} between the limit and the bracket.
- p.18 proof of 1.39 line 4 of the proof $V_\phi: F \rightarrow V_\phi$ should read $V_\phi \cap F_\phi \rightarrow V_\phi$.
line 8 of the proof $f^{-1}(U_\phi)$ should be $f^{-1}(U_\phi \cap N)$. In this and the next line the spaces F should be F_ϕ .
- p.19 Lemma 1.41 proof of (b) the Formula should read

$$h_\psi \circ h_\phi^{-1}(y) = \dots = d(\psi \circ \phi^{-1})(p_\phi; y).$$

- p.20 1.3 in the displayed formula replace v with y .
- p.49 Example 3.3 (b) subscript in the first line should read \mathbb{R}^n not R^n .
- p.62, 3.31.: The definition of the logarithmic derivative should read

$$\delta^\ell(c): [a, b] \rightarrow \mathbf{L}(G), \quad t \mapsto T\lambda_{c(t)}^{-1}(\dot{c}(t)).$$

- p. 77 Example 3.55: Unfortunately, the concrete example is flawed as I tried to avoid introducing complex matrix groups. It should be about the cover $SU(2)$ of the group $SO_3(\mathbb{R})$. Repair the example as follows: Amend the sentence starting with “Recall” as “... *the twofold cover $SU(2)$ of $SO_3(\mathbb{R})$ can be identified with the 3-dimensioanl unit sphere.* Two sentences later the sentence should begin as *Lifting this identification....* Finally, the following $SO_3(\mathbb{R})$ should be an $SU(2)$.
- 4.17: S_2 and $S_{U,2}$ are the same map, so S_2 should be relabeled $S_{U,2}$.
- p. 123, Exercise 6.1.1 (b) $\overline{\{y \in M \mid h(y) \neq y\}}$ instead of $\overline{\{y \in M \mid h(x) \neq x\}}$.
- p. 139, the integral in the statement of 7.2 should be \int_0^1 not \int_a^b . In the proof it should rather be $\text{En}(q(s, \cdot))$ instead of $\text{En}(q(s))$. In the displayed equation: c, h in the first term of the first line should be $c(t)$ and $h(t)$, after the first equality, term in the integral should read $g_U(c(t), B_U(c(t), c'(t), c'(t)), h(t))$.

- p. 140, the integrals should be $\int_{\mathbb{S}^1}$ instead of $\int_{\mathbb{S}^1}^1$
- p. 188, 2nd line of (d): It should be $\alpha^{-1}(U)$ instead of $\alpha^{-1}(U \times U)$, last line of (g) after the first inclusion the w should be a capital W .
- p. 189, end of second line of the proof of A.10 should read $-\lambda N \cap \lambda N \subseteq M$. Delete the sentence starting with “By Lemma A.2(c)...”
- p. 189 Exercise A.1.1 is missing at the end of the first sentence “such that $0 \in B^\circ$ ”.
- p.190. The first displayed equation should read $0 < 3\delta = \dots \leq 2\delta$. In the second displayed equation and later it should be $U_{x_0+y_0}$ instead of U_{x+y}