Errata for

Population-Based Optimization on Riemannian Manifolds

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Chapter 2 There are instances where p should be replaced by x:

P.13 Equation above (2.1): the last p should be x, i.e. the equation should read:

$$D_v|_x f = \sum_{i=1}^{n} v^i \frac{df}{dx^i}(x) \quad .$$

P.16 First sentence of the 4^{th} paragraph down the page, pushforward φ_* maps to $T_{\varphi(x)}\mathbb{R}^n$, i.e. the first sentence of the paragraph should read: The pushforward of the local coordinate map is given by: $\varphi_* : T_x M \to T_{\varphi(x)}\mathbb{R}^n \ldots$

P.25 Second paragraph of Definition 2.22 should begin with: For any $x \in M$, the **ball of injectivity radius**, denoted by $B(\vec{0}, \text{inj}(x)) \subset U_x \ldots$

P.14 The three instances of "equivalent class" should be replaced by "equivalence class".

P.16 The following sentence, the first element of the basis starts at $\frac{\partial}{\partial x^1}\big|_{\varphi(x)}$, i.e. it should read:

$$\left(\frac{\partial}{\partial x^1}\bigg|_{\varphi(x)}, \ldots, \frac{\partial}{\partial x^n}\bigg|_{\varphi(x)} \right)$$

P.17 Definition 2.13: The image of Riemannian metric is $\mathbb{R}$, i.e. the equation should read:

$$\begin{aligned} g : T_x M \times T_x M &\to \mathbb{R} \\ (X, Y) &\mapsto g(X, Y) =: \langle X, Y \rangle_g \end{aligned}$$

P.19 Equation above (2.4): the summation should be from $k = 1$ to $k = n$, i.e. the equation should read:

$$\nabla_{E_i} E_j = \sum_{k=1}^{n} \Gamma_{i,j}^k E_k \quad ,$$

P.20 Definition 2.19: Add comma between I and P_{t_0,t_1}.

P.21 Add bracket to the top of the last line of the equation after $P_{t_0,t}^{-1}$, whence the last line should read:

$$\ldots = \sum_{j=1}^{n} \lim_{t \to t_0} \frac{P_{t_0,t}^{-1}\left(V^j(t)\tilde{\partial}_j(t)\right) - V^j(t_0)\partial_j}{t - t_0} = \lim_{t \to t_0} \frac{P_{t_0,t}^{-1} V(t) - V(t_0)}{t - t_0}$$

P.23 Second last line should read: Given a point $x \in M$ and a normal neighbourood N_x of x, let $\{e_1(x), \ldots, e_n(x)\} \ldots$

P.29 First equation is better understood as a definition:

$$\left[\frac{\partial p_\theta}{\partial \theta^i} \right] f\bigg|_{x_0} := \frac{\partial f\left(p(x_0|\theta)\right)}{\partial \theta^i} \in \mathbb{R} \quad .$$

P.30 Section 3.2: Remove (countably) from first sentence of the section.

P.118 Equation on the bottom: replace the last two k in last term of the first line by $k+1$, i.e. the equation should read:

$$\begin{aligned}\hat{p}(x|\xi^{k+1}) &:= \sum_{\alpha\in\hat{\Lambda}^{k+1}} \varphi_\alpha^{k+1}\cdot\tilde{p}(x|\theta_{k+1}^\alpha) = \sum_{\alpha\in\Lambda^{k+1}} \varphi_\alpha^{k+1}\cdot\tilde{p}(x|\theta_{k+1}^\alpha) + \sum_{\alpha\in\hat{\Lambda}^{k+1}\setminus\Lambda^{k+1}} \varphi_\alpha^{k+1}\cdot\tilde{p}(x|\theta_{k+1}^\alpha)\\ &= \sum_{\alpha\in\Lambda^{k+1}} \varphi_\alpha^{k+1}\cdot\tilde{p}(x|\theta_{k+1}^\alpha) + 0 = p(x|\xi^{k+1}) \quad .\end{aligned}$$

P.131 In Equation (8.27), replace α' the subscript of the first summation by α, i.e. the equation should read:

$$\varphi_\alpha^k = \frac{-E_\alpha-\epsilon_0}{\sum_{\alpha\in\Lambda}(-E_\alpha-\epsilon_0)} \cong \frac{-E_\alpha}{\sum_{\alpha\in\Lambda}-E_\alpha} \quad .$$

P.133, 135 The union of the first equation of the proof of Lemma 8.1 and the first equation of the proof of Theorem 8.1 should start from 0, i.e. the equation should read:

$$W^k = \cup_{j=0}^k \hat{V}^j \subset M \quad .$$

P.135 Since $W^N = M$ is indexed by Λ^N, the second last line of the final equation of the proof of Theorem 8.1 should read:

$$\sup_{\alpha\in\Lambda^N} \int_{\tilde{B}_\alpha\subset M=W^N} f(x)p(x|\theta^\alpha)dx$$

- Readers have remarked that colored images and diagrams were printed in black and white.

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