

Errata

Statistical Optimization for Geometric Computation: Theory and Practice

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p. 35 third line below eq. (2.49)

Error: Let $\{\mathbf{n}_1, \dots, \mathbf{n}_m\}$ be

Correct: Let $\{\mathbf{n}_1, \dots, \mathbf{n}_{n-m}\}$ be

p. 35 eq. (2.50)

Error:
$$\mathbf{P}_{\mathcal{N}} = \mathbf{I} - \sum_{i=1}^m \mathbf{n}_i \mathbf{n}_i^{\top}$$

Correct:
$$\mathbf{P}_{\mathcal{N}} = \mathbf{I} - \sum_{i=1}^{n-m} \mathbf{n}_i \mathbf{n}_i^{\top}$$

p. 42 first line below eq. (2.91)

Error: By multiplying the first equation by

Correct: By multiplying the second equation by

p. 44 first line

Error: matrix \mathbf{P}_0 implies

Correct: matrix \mathbf{P}_1 implies

p. 44 first line below eq. (2.105)

Error: where λ_{\max} is the smallest

Correct: where λ_{\max} is the largest

p. 46 eq. (2.117)

Error:
$$\leq \sum_{i=1}^r \lambda_{\max}^2(\mathbf{u}_i, \mathbf{x})^2 =$$

Correct:
$$\leq \sum_{i=1}^n \lambda_{\max}^2(\mathbf{u}_i, \mathbf{x})^2 =$$

p. 47 eq. (2.120)

Error: $\mathbf{x} \propto \mathbf{u}_{\max} + \mathcal{N}_{\mathbf{A}}$

Correct: $\mathbf{x} \propto \mathbf{u}_{\max}$

p. 47 three lines below eq. (2.120)

Error: The right-hand side means ... the singular value λ_{\max} .

Correct: *delete*

p. 60 eq. (2.205)

Error: $\mathbf{A}_s = A[\mathbf{A}]$.

Correct: $\mathbf{A}_a = A[\mathbf{A}]$.

p. 62 eq. (3.9)

Error: $X \sim E[X] + O(\frac{1}{\sqrt{N}})$,

Correct: $\bar{X} \sim E[X] + O(\frac{1}{\sqrt{N}})$,

p. 62 first line below eq. (3.9)

Error: and hence $X \sim E[X]$

Correct: and hence $\bar{X} \sim E[X]$

p. 66 third line below eq. (3.28)

Error: along a curve (Fig. 3.2b)

Correct: along a curve (Fig. 3.2c)

p. 66 fourth line below eq. (3.28)

Error: (Fig. 3.2c). If

Correct: (Fig. 3.2d). If

p. 72 second line below eq. (3.54)

Error: its characteristic function has

Correct: its moment generating function has

p. 77 fifth line below eq. (3.74)

Error: the null space of \mathbf{A}

Correct: the orthogonal complement of the null space of \mathbf{A}

p. 85 eq. (3.128)

Error: $+P_{\theta}^S \int_{\chi} \hat{\theta}(x)(\nabla_{\theta} \log p, \Delta\theta)p(x; \theta)dx$

Correct: $+P_{\theta}^S \int_{\chi} (\hat{\theta}(x) - \theta)(\nabla_{\theta} \log p, \Delta\theta)p(x; \theta)dx$

p. 105 eq. (4.42)

Error: $(\mathbf{p}, \Delta\mathbf{p}) + (\mathbf{n}, \Delta\mathbf{n}) = 1$

Correct: $(\mathbf{p}, \Delta\mathbf{p}) + (\mathbf{n}, \Delta\mathbf{n}) = 0$

p. 109 first line below eq. (4.61)

Error: where $\boldsymbol{\nu} \propto \mathbf{n} \oplus (-1)$

Correct: where $\boldsymbol{\nu} \propto \mathbf{n} \oplus (-d)$

p. 117 first line above eq. (4.94)

Error: if $a < b$ ($a > b$).

Correct: if $a > b$ ($a < b$).

p. 117 second line from bottom

Error: called the *axis* and the *vertex*,

Correct: called the *vertex* and the *axis*,

p. 119 second line above eq. (4.99)

Error: and σ_1 , σ_2 , and σ_2

Correct: and σ_1 , σ_2 , and σ_3

p. 119 first line below eq. (4.99)

Error: principal axes in the the

Correct: principal axes in the

p. 119 second line below eq. (4.99)

Error: radii σ_1 , σ_2 , and σ_2

Correct: radii σ_1 , σ_2 , and σ_3

p. 126 eqs. (4.124)

Error: $\boldsymbol{\nu}' = N\left[\begin{pmatrix} \mathbf{R} & \mathbf{0} \\ -\mathbf{h}^\top \mathbf{R} & 1 \end{pmatrix} \boldsymbol{\nu}\right], \quad \boldsymbol{\nu} = N\left[\begin{pmatrix} \mathbf{R}^\top & \mathbf{0} \\ \mathbf{h}^\top & 1 \end{pmatrix} \boldsymbol{\nu}'\right].$

Correct: $\boldsymbol{\nu}' = N\left[\begin{pmatrix} \mathbf{R}^\top & \mathbf{0} \\ \mathbf{h}^\top & 1 \end{pmatrix} \boldsymbol{\nu}\right], \quad \boldsymbol{\nu} = N\left[\begin{pmatrix} \mathbf{R} & \mathbf{0} \\ -\mathbf{h}^\top \mathbf{R} & 1 \end{pmatrix} \boldsymbol{\nu}'\right]$

p. 133 fourth line from top

Error: $F^{(k)}(\mathbf{u}_1, \dots, \mathbf{u}_L)$

Correct: $F^{(k)}(\mathbf{u}_1, \dots, \mathbf{u}_N)$

p. 133 first line below eq. (5.5)

Error: $F^{(k)}(\mathbf{u}_1, \dots, \mathbf{u}_L)$

Correct: $F^{(k)}(\mathbf{u}_1, \dots, \mathbf{u}_N)$

p. 152 eq. (5.117)

Error: $\hat{J} > \chi_{3,a}^2$

Correct: $\hat{J} > \chi_{4,a}^2$

p. 157 eq. (5.145)

Error: $\hat{\boldsymbol{\nu}} = N[\boldsymbol{\nu}_1 - \Delta\boldsymbol{\nu}_1] = N[\boldsymbol{\nu}_2 - \Delta\boldsymbol{\nu}_1]$

Correct: $\hat{\boldsymbol{\nu}} = N[\boldsymbol{\nu}_1 - \Delta\boldsymbol{\nu}_1] = N[\boldsymbol{\nu}_2 - \Delta\boldsymbol{\nu}_2]$

p. 180 Fig. 6.5

Error: Fig. 6.5(a) and Fig. 6.5(b) are in opposit order.

Correct: Interchange Fig. 6.5(a) with Fig. 6.5(b).

p. 230 last line

Error: decrease by two

Correct: decrease by three

p. 338 eq. (11.71)

Error: $\mathbf{G}\mathbf{G}^\top = (\mathbf{h} \times \mathbf{R})(\mathbf{h} \times \mathbf{R})^\top = (\mathbf{h} \times \mathbf{I})\mathbf{R}\mathbf{R}^\top(\mathbf{h} \times \mathbf{I})^\top(\mathbf{h} \times \mathbf{I})(\mathbf{h} \times \mathbf{I})^\top = \mathbf{P}\mathbf{h}$.

Correct: $\mathbf{G}\mathbf{G}^\top = (\mathbf{h} \times \mathbf{R})(\mathbf{h} \times \mathbf{R})^\top = (\mathbf{h} \times \mathbf{I})\mathbf{R}\mathbf{R}^\top(\mathbf{h} \times \mathbf{I})^\top = (\mathbf{h} \times \mathbf{I})(\mathbf{h} \times \mathbf{I})^\top = \mathbf{P}\mathbf{h}$.

p. 339 eq. (11.79)

Error: $\mathbf{K} = \mathbf{V}_\mathbf{h} \text{diag}(1, 1, 0) \mathbf{V}_\mathbf{h}^\top \mathbf{R} = (\mathbf{v}_1, \mathbf{v}_2, \mathbf{h}) \boldsymbol{\Lambda} (\mathbf{R}^\top \mathbf{v}_1, \mathbf{R}^\top \mathbf{v}_2, \mathbf{R}^\top \mathbf{v})^\top$.

Correct: $\mathbf{K} = \mathbf{V}_h \text{diag}(1, 1, 0) \mathbf{V}_h^\top \mathbf{R} = (\mathbf{v}_1, \mathbf{v}_2, \mathbf{h}) \mathbf{\Lambda} (\mathbf{R}^\top \mathbf{v}_1, \mathbf{R}^\top \mathbf{v}_2, \mathbf{R}^\top \mathbf{h})^\top$.

p. 425 eq. (13.24)

Error:
$$\begin{aligned} \sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \bar{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2 &= \sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \tilde{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2 + \sum_{\alpha=1}^N \|\tilde{\mathbf{a}}_\alpha - \bar{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2 \\ &= \sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \tilde{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2 + dN \end{aligned}$$

Correct:
$$\begin{aligned} E\left[\sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \bar{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2\right] &= E\left[\sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \tilde{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2\right] + E\left[\sum_{\alpha=1}^N \|\tilde{\mathbf{a}}_\alpha - \bar{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2\right] \\ &= E\left[\sum_{\alpha=1}^N \|\hat{\mathbf{a}}_\alpha - \tilde{\mathbf{a}}_\alpha\|_{V[\mathbf{a}_\alpha]}^2\right] + dN \end{aligned}$$