Linear Algebra, Data Science, and Machine Learning
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Errata

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- Page 141: Equation with $R \circ S$ on left hand side:

  Change $\mathbf{u}_j \mathbf{u}_j^T$ to $\mathbf{u}_i \mathbf{u}_i^T$.

- Page 188: Proof of Theorem 6.9:

  Change $b = \mathbf{y}^T \mathbf{f}$ to $b = -\mathbf{y}^T \mathbf{f}$.

- Page 205, Exercise 4.8:

  Change A to H twice:

  $$\mathbf{x}_{k+1} = \mathbf{x}_k - \alpha_k(H\mathbf{x}_k - \mathbf{b}) \qquad \text{and} \qquad \mathbf{r}_k = H\mathbf{x}_k - \mathbf{b}.$$

- Page 213:

  Change x to $\mathbf{x}$ on the line immediately below Eq. (6.79).

- Page 214: Definition 6.32:

  Change the definition to read "is the $n \times n$ self-adjoint matrix defined by the inequality".

- Page 275: Equation 7.62:

  Change the equation to read

  $$\min_{\substack{\mathbf{w} \in \mathbb{R}^n \\ b \in \mathbb{R}}} \left\{ \|\mathbf{w}\|^2 \;\middle|\; y_i(\mathbf{x}_i \cdot \mathbf{w} - b) \geq 1, \;\; i = 1, \ldots, m \right\}.$$

- Page 275: Equation 7.63:

  Change the equation to read

  $$\min_{\mathbf{w}, b} \left\{ \|\mathbf{w}\|^2 \;\middle|\; \mathbf{z} \cdot \mathbf{w} - b \geq 1, \;\; \mathbf{z} \cdot \mathbf{w} + b \geq 1 \right\}.$$

- Page 306: Theorem 7.22:

  The assumptions on convexity/concavity of F should be switched, and D must be nonempty. The correct statement of the theorem should read:

1

Let $D \subset \mathbb{R}^m$ be compact, i.e., closed and bounded, and nonempty. Let $F \colon D \times \mathbb{R}^n \to \mathbb{R}$ be continuous, and suppose that $F(\mathbf{x}, \mathbf{y})$ is convex as a function of $\mathbf{y}$ for each fixed $\mathbf{x} \in \mathbb{R}^m$, while $F(\mathbf{x}, \mathbf{y})$ is concave, i.e., $-F(\mathbf{x}, \mathbf{y})$ is convex, as a function of $\mathbf{x}$ for each fixed $\mathbf{y} \in \mathbb{R}^n$. Then,

$$\min_{\mathbf{y} \in \mathbb{R}^n} \max_{\mathbf{x} \in D} F(\mathbf{x}, \mathbf{y}) = \max_{\mathbf{x} \in D} \min_{\mathbf{y} \in \mathbb{R}^n} F(\mathbf{x}, \mathbf{y}).$$

- Page 307: Equation (7.112):

  Change $\sum_{i=1}^{n}$ to $\sum_{i=1}^{m}$.

- Page 307: Remark 7.23:

  Replace "exactly those" with "a subset of the".

- Page 309:

  Change $\sum_{i=1}^{n}$ to $\sum_{i=1}^{m}$.

- Page 333: Equation (8.33):

  Change Q to Q^T.

- Page 333: Equation (8.34):

  Change Q_k to Q_k^T.

- Page 346, Exercise 4.1:

  Delete "How does the accuracy change with the number of principal components used?"

- Page 541, Eq. (10.94):

  Remove extra left parenthesis, so equation should read

  $$\Phi(\mathbf{x}) = \prod_{i=1}^{n} \theta(x_i) = \prod_{i=1}^{n} \left(1 - |x_i| \right)_+.$$

- Page 543, line -6:

  Remove first "the" in "...it is the only the lower intrinsic...".