Errata of *Modern Nonconvex Nondifferentiable Optimization*

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- Page 5, the first paragraph of the proof of Proposition 1.1.1.

  Replace the sentence *For each positive integer ν, let i_ν be the smallest integer greater than ν such that* $\|x^{i_\nu} - x^\infty\| > \delta$ with the following one:

  Let $\{x^{j_\nu}\}$ with $j_{\nu+1} > j_\nu$ be a subsequence in the neighborhood of $\mathcal{N}(x^\infty, \delta)$ converging to x^∞. For each ν, let i_ν be the smallest integer $i > \max(j_\nu, i_{\nu-1})$ such that $\|x^{i_\nu} - x^\infty\| > \delta$.

- Page 26, Exercise 1.2.4. Change to the following:

  For a vector x (or a matrix A), let $|x|$ (or A) be the vector (or the matrix) whose components are equal to the absolute values of the corresponding components of x (or A). A norm $\| \bullet \|$ on $\mathbb{R}^n$ is said to be *monotonic* if $|x| \leq |y|$ implies $\|x\| \leq \|y\|$ for all x and y in $\mathbb{R}^n$. Similarly, a norm $||| \bullet |||$ on $\mathbb{R}^{n\times n}$ is monotonic if $|A| \leq |B|$ implies $|||A||| \leq |||B|||$.

  Show the following:

  (a) A vector norm $\| \bullet \|$ is monotonic if and only if $\|x\| = \| \, |x| \, \|$ for all $x \in \mathbb{R}^n$.

  (b) A matrix norm induced by a monotonic vector norm is monotonic.

- Page 66, Proposition 2.1.1(3): it should be: there exists $y \geq 0$ such that $A^\top y < 0$.

- Page 91, Lemma 2.5.1. The correct statements should be:

  Suppose that f is continuously differentiable. Let $\{x^\nu\}$ be an infinite sequence generated by Algorithm 2.5.1. If $\{x^\nu\}$ and $\{d^\nu\}$ are bounded, then the following statements must hold:

  (a) The sequence $\{f(x^\nu)\}$ converges.

  (b) $\lim_{\nu\to\infty} \nabla f(x^\nu)^\top d^\nu = 0$.

- Page 92, Theorem 2.5.1. Need to assume that the direction d^ν to be *gradient related* to $\{x^\nu\}$, i.e., for any subsequence of $\{x^\nu\}_{\nu\in\kappa}$ converging to a nonstationary point, $\limsup_{\nu\to\infty} \nabla f(x^\nu)^\top d^\nu < 0$.

- Page 134: $Y^\top Z$ should be $\mathrm{tr}(Y^\top Z)$.

- Page 140: The closure of the set is $\mathbb{R}^2$.

- Page 167 line 14: x' should be w'.

- Page 536 Theorem 9.2.1 and related results, the Lipschitz continuity of f on the closed set X should be replaced by its Lipschitz continuity on open sets where the boundedness condition: $f'(\bar{x}; v) \leq L\|v\|$ holds.

- Page 679, Exercise 11.3.1: first line $\{\widehat{f}\}_{i=1}^N$ should be $\{\widehat{f}_i\}_{i=1}^N$

- A lot of places: *implicit* convex-concave functions should be *implicitly* convex-concave functions