Errata for *Lectures on Stochastic Programming*

Page 6. It is assumed in (1.15) that the cdf $H(\cdot)$ is continuous.

Page 9. In the first linear programming problem, the second part of the object function: the index of $j$ is from 1 to $m$, instead of $n$.

Page 25, Ex. 1.10, the optimal value function $Q_t(W_t)$ is concave in $W_t$, instead of convex.

Page 40, In the fourth line of the statement of Theorem 2.11: replace $D(x, \xi(w))$ by $D(\bar{x}, \xi(w))$.

In the proof of the same theorem, above the equation (2.41) in the phrase “Using the characterization of the subdifferential of $\phi(\cdot)$ given in (2.8)”: (2.8) should be (2.34).

Right above (2.41), replace $D(x_0, \xi(w))$ by $D(\bar{x}, \xi(w))$.

Page 134, two lines below (4.75), in the formula for $\nabla_z x(z)$ (the gradient of $x(z)$ at $z$) the two subscripts $x$ and $z$ are switched. That is, the formula should be

$$\nabla_z x(z) = -\frac{\nabla_x g(x,z)}{\nabla_x g(x,z)}.$$

Theorem 4.56 on p. 115 should read:

Assume that $P_Z$ has a continuous density $\theta(\cdot)$ and the functions $t_i \mapsto \int_{t_i}^{z_i} \ldots \int_{t_i}^{z_i+1} \ldots \int_{t_i}^{z_s} \theta(t_1, \ldots, t_i, \ldots, t_s) dt_1 \ldots dt_{i-1} dt_{i+1} \ldots dt_s$ are continuous for all $z \in \mathbb{R}^s$. Then the distribution function $F_Z$ is continuously differentiable.

Page 115, line 8 from below: substitute “continuity of the one-dimensional marginal function $F_{Z_i}$,” by “continuity assumptions.”

Page 152 in Exercise 4.9 two terms are missing in the function under the probability. The inequality should be

$$x_1^2 + x_2^2 + Y x_2 + x_2 x_3 + Y x_3 + Y^2 + x_3^2 \leq Z$$

Page 153, Ex. 4.12 (b),(c). Replace $i = 1, \ldots, m$ with $i = 1, \ldots, n$.

Page 185, third line above section 5.3.2. Replace $\psi^*(z) = a|z| - a^2 \sigma^2$ with $\psi^*(z) = a|z| - a^2 \sigma^2/2$.

Page 190, formula (5.127) should be

$$N \geq \frac{O(1)\lambda^2 D^2 a,\varepsilon}{(\varepsilon - \delta)^2} \left[ n \ln \left( \frac{O(1)LD^* a}{\varepsilon - \delta} \right) + \ln \left( \frac{1}{\alpha} \right) \right].$$

Proof. By Theorem 7.79 we have that $\rho$ is continuous on the interior of its domain. Consider a point $Z_0$ in the interior of $\text{dom}(\rho)$. Since $\rho$ is continuous at $Z_0$, it follows that there exists $r > 0$ such that $|\rho(Z) - \rho(Z_0)| < 1$ for all $Z$ such that $\|Z - Z_0\| \leq r$. By changing variables $Z \mapsto Z - Z_0$, we can assume without loss of generality that $Z_0 = 0$.

Now let us observe that for any $Z \in Z$ and $Z^+ = [Z(\omega) - c]_+$, $c \in \mathbb{R}$, it holds that

$$\lim_{c \to +\infty} \|Z^+_c\|^p = \lim_{c \to +\infty} \int Z(\omega) - c|^p dP(\omega) = 0.$$ 

Therefore there exists $c \in \mathbb{R}$ (depending on $Z$) such that $\|Z^+_c\| < r$, and hence

$$\rho(Z^+_c) \leq \rho(0) + 1 < +\infty.$$ 

Noting that $Z \leq c + Z^+_c$, we can write

$$\rho(Z) \leq \rho(Z^+_c + c) = \rho(Z^+_c) + c < +\infty.$$ 

This shows that $\rho(Z)$ is finite valued for any $Z \in Z$. Continuity of $\rho(\cdot)$ follows now by Proposition 6.5.

Page 286, line 2. Replace “As before, we use space $Z = L^r_p(\Omega, \mathcal{F}, P)$, where $P$ ...” with “As before, we use space $Z = L^p_p(\Omega, \mathcal{F}, P)$, $p \in [1, \infty)$, where $P$ ...” (the function $\varphi_p(t)$ can be discontinuous for $p = \infty$).

Page 299, line 6. Replace “$\rho(\xi_1) > \rho(\xi_2)$” with “$\rho(-\xi_1) > \rho(-\xi_2)$”.

Page 301, eq. (6.185). Replace $Z$ with $Y \sim \mathcal{N}(0, \gamma^2)$.

Page 302. In equation (6.191) replace the second line with $z + c[z - t]_+ + c(1 - \gamma)(t - z)$.

Page 304, eq. (6.205). Replace $\sum_{j=1}^N \mathcal{G}(P, \Delta(z) - P)$ with $\mathcal{G}(P, \Delta(z) - P)$.

Page 305, equation below (6.207). Replace $\mathcal{G}(P + t(Q - P)) - \mathcal{G}(P + t(Q - P))$ with $\mathcal{G}(P + t(Q - P))$.

Page 311, line 4 from the bottom. It should be $f_t : \mathbb{R}^n \times \Omega \to \mathbb{R}$.

Page 317. Replace eq. (6.258) with: $\mathcal{E}_{\mu} [Z|\mathcal{F}_1]_1(\omega) = \int_{A_i} Z_\xi \mathcal{P}$ if $\omega \in A_i$, and we will set this to $-\infty$ if $\omega \notin A_i$”.

Page 331, line 7. Replace “$\bar{H}(z) = \max\{\alpha^{-1}H^*(z), 1\}$” with “$\bar{H}(z) = \min\{\alpha^{-1}H^*(z), 1\}$”.

Page 331, last line equation (6.329) – should be $\Pr\{\ldots\} \geq 1 - \alpha$. The same in last line of equation (6.330).

Page 362, in lines 11-12 of the proof of Theorem 7.32 replace $a$ with $\alpha$, i.e., it should be $\int \mathcal{F}d\mu \leq \alpha f(\omega), \ldots$

Page 400. Equation (7.232) should be

$$\tilde{\zeta}(\omega) = \frac{\text{sign}(z(\omega))|z(\omega)|^{p-1}}{\|z|^{p-1}\|_q}.$$
Note that $1/(q - 1) = p - 1$.

Page 405. In Proposition 7.80 it should be $f : \mathbb{R}^m \times \Omega \to \mathbb{R}$, i.e., $f(x, \omega)$ is an extended real valued function.