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 $\mathfrak{D}(x, \xi(w))$ by $\mathfrak{D}(\bar{x}, \xi(w))$.

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 $\mathfrak{D}(x_0, \xi(w))$ by $\mathfrak{D}(\bar{x}, \xi(w))$.

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

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

Theorem 4.56 on p. 115 should read:
Assume that P_Z has a continuous density $\theta(\cdot)$ and the functions $t_i \mapsto \int_{-\infty}^{z_1} \cdots \int_{-\infty}^{z_{i-1}} \int_{-\infty}^{z_{i+1}} \cdots \int_{-\infty}^{z_s} \theta(t_1, \ldots, t_i, \ldots, t_s)\, dt_1 \ldots dt_{i-1} dt_{i+1} \ldots dt_s$ 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_1}." by "continuity assumptions."

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

$$x_1^2 + x_2^2 + Yx_2 + x_2x_3 + Yx_3 + Y^2 + x_3^2 \le Z$$

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

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

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

Page 264. Corrected proof of Proposition 6.7.

Proof. By Theorem 7.79 we have that ρ is continuous on the interior of its domain. Consider a point Z_0 in the interior of $\mathrm{dom}(\rho)$. Since ρ 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 $\|Z - Z_0\| \le r$. 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 $Z \in \mathcal{Z}$ and $Z_c^+(\omega) := [Z(\omega) - c]_+$, $c \in \mathbb{R}$, it holds that

$$\lim_{c\to+\infty} \left\|Z_c^+\right\|^p = \lim_{c\to+\infty} \int_{Z(\omega)\ge c} |Z(\omega) - c|^p dP(\omega) = 0.$$

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

$$\rho(Z_c^+) \le \rho(0) + 1 < +\infty.$$

Noting that $Z \preceq c + Z_c^+$, we can write

$$\rho(Z) \le \rho(Z_c^+ + c) = \rho(Z_c^+) + c < +\infty.$$

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

Page 286, line 2. Replace "As before, we use space $\mathcal{Z} = \mathcal{L}_p(\Omega, \mathcal{F}, P)$, where P ..." with "As before, we use space $\mathcal{Z} = \mathcal{L}_p(\Omega, \mathcal{F}, P)$, $p \in [1, \infty)$, where P ..." (the function $\varphi_\rho(t)$ 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 $\sum_{j=1}^N \mathfrak{F}'(P, \Delta(z) - P)$ with $\mathfrak{F}'(P, \Delta(z) - P)$.

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

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

Page 317. Replace eq. (6.258) with: "$\mathbb{E}_{\mu_i}[Z|\mathcal{F}_1](\omega) = \int_{A_i} Z\zeta_i dP$ 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 $\mathsf{Pr}\{...\} \ge 1 - \alpha$. 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 α, i.e., it should be $\int f d\mu \le \alpha f(\omega)$, ...

Page 400. Equation (7.232) should be

$$\tilde{\zeta}_z(\omega) = \frac{\mathrm{sign}(z(\omega))|z(\omega)|^{p-1}}{\|\,|z|^{p-1}\|_q}.$$

Note that $1/(q-1) = p-1$.

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