Mathematical Foundations of Reinforcement Learning
Errata list for the Springer version published in January 2025
Updated in July 2025

Note: The PDF version on GitHub already incorporates these corrections.

Chapter 2:

◇ Section 2.7.1: Change "a radius equal to $\sum_{j\neq i}[I-\gamma P_\pi]_{ij} = -\sum_{j\neq i}\gamma p_\pi(s_j|s_i)$" to "a radius equal to $\sum_{j\neq i}\left|[I-\gamma P_\pi]_{ij}\right| = \sum_{j\neq i}\gamma p_\pi(s_j|s_i)$"

Chapter 8:

◇ Algorithm 8.2: Change "ε" to "ϵ"

◇ Algorithm 8.3: Change "ε" to "ϵ"

Chapter 9:

◇ Box 9.5: Change "it holds that $\lim_{k\to\infty} P_\pi^k = d_\pi^T \mathbf{1}_n$" to "it holds that $\lim_{k\to\infty} P_\pi^k = \mathbf{1}_n d_\pi^T$"

◇ Box 9.5: Change

$$\lim_{k\to\infty}(P_\pi - \mathbf{1}_n d_\pi^T)^k = \lim_{k\to\infty} P_\pi^k - d_\pi^T \mathbf{1}_n = 0.$$

to

$$\lim_{k\to\infty}(P_\pi - \mathbf{1}_n d_\pi^T)^k = \lim_{k\to\infty} P_\pi^k - \mathbf{1}_n d_\pi^T = 0.$$

Chapter 10:

◇ Section 10.3.3: Change

$$\theta_{t+1} = \theta_t + \alpha_\theta \frac{\pi(a_t|s_t,\theta)}{\beta(a_t|s_t)} \nabla_\theta \ln \pi(a_t|s_t,\theta)\delta_t(s_t,a_t).$$

to

$$\theta_{t+1} = \theta_t + \alpha_\theta \frac{\pi(a_t|s_t,\theta_t)}{\beta(a_t|s_t)} \nabla_\theta \ln \pi(a_t|s_t,\theta_t)\delta_t(s_t,a_t).$$

Appendix A:

◇ Item *Gradient of expectation:* Change "$\mathbb{E}[f(X,\beta)] = \sum_x f(x,a)p(x)$" to "$\mathbb{E}[f(X,\beta)] = \sum_x f(x,\beta)p(x)$"

- Item *Gradient of expectation:*
  Change "$\nabla_\beta \mathbb{E}[f(X,\beta)] = \nabla_\beta \sum_x f(x,a)p(x) = \sum_x \nabla_\beta f(x,a)p(x) = \mathbb{E}[\nabla_\beta f(X,\beta)]$"
  to "$\nabla_\beta \mathbb{E}[f(X,\beta)] = \nabla_\beta \sum_x f(x,\beta)p(x) = \sum_x \nabla_\beta f(x,\beta)p(x) = \mathbb{E}[\nabla_\beta f(X,\beta)]$"
- Item *Variance, covariance, covariance matrix:* Change $\bar{X}$ and $\bar{Y}$ to $\bar{x}$ and $\bar{y}$, respectively

Appendix D:

- Section *Convexity:* Change

$$f(cx + (1-x)y) \leq cf(x) + (1-c)f(y)$$

  to

$$f(cx + (1-c)y) \leq cf(x) + (1-c)f(y)$$

Bibliography