Appendix E

Errata

Page 13, Exercise 1.5.6 (8) should read:

Prove that f is a regulated function on $I = [a, b]$ if and only if both of the limits

$$\lim_{x \to c+} f(x) \quad \text{and} \quad \lim_{x \to d-} f(x)$$

exist for every $c \in [a, b)$ and every $d \in (a, b]$.

Page 108, line5 should read:

$$= \|w\|^2 - \sum_{n=0}^{N} |a_n|^2 + \sum_{n=0}^{N} (a_n - c_n)\overline{(a_n - c_n)}$$

Page 116, lines 13–14 should read:

with $|g(x) - p(x)| < \varepsilon/4$ for all x. So

$$\|g - p\|^2 = \frac{1}{\pi} \int (g - p)^2 \, d\mu \leq \frac{1}{\pi} \int \frac{\varepsilon^2}{16} \, d\mu = \frac{\varepsilon^2}{8}.$$

Hence, $\|f - p\| \leq \|f - g\| + \|g - p\| < \varepsilon/2 + \varepsilon/\sqrt{8} < \varepsilon$.

Page 135, the second paragraph of the proof of 7.2.2 should read:

Conversely, if f is a T-invariant measurable function then its real part, $u(x)$, and imaginary part, $v(x)$, are T-invariant. If f is not ν-almost everywhere constant, then at least one of $u(x)$ and $v(x)$ is not ν-almost everywhere constant. Suppose, without loss of generality, that it is $u(x)$. Then there is a $c \in \mathbb{R}$ such that the set $A = u^{-1}([-\infty, c))$ satisfies $\nu(A) > 0$ and $\nu(A^c) > 0$. The set A is T-invariant.

Page 187, Lemma B.3.9 and its proof should read:

Lemma B.3.9. *Suppose A_0 and B_0 are disjoint sets in $\mathcal{M}_0$ and X_0 is an arbitrary subset of $\mathbb{R}$. If $A = A_0 \cap X_0$ and $B = B_0 \cap X_0$ then*

$$\mu^*(A \cup B) = \mu^*(A) + \mu^*(B).$$

The analogous result for a finite union of disjoint sets is also valid.

Proof. Since A_0 and B_0 are disjoint, so are A_0 and B, and therefore $A_0 \cap B = \emptyset$ and $A_0^c \cap B = B$. Hence

$$A_0 \cap (A \cup B) = (A_0 \cap X_0) \cup (A_0 \cap B \cap X_0) = A_0 \cap X_0 = A.$$

Likewise,

$$A_0^c \cap (A \cup B) = (A_0^c \cap A_0 \cap X_0) \cup (A_0^c \cap B) = B.$$

Hence, the fact that A_0 is in $\mathcal{M}_0$ (using $A \cup B$ for X in the definition of $\mathcal{M}_0$) tells us

$$\begin{aligned} \mu^*(A \cup B) &= \mu^*(A_0 \cap (A \cup B)) + \mu^*(A_0^c \cap (A \cup B)) \\ &= \mu^*(A) + \mu^*(B). \end{aligned}$$

The result for a finite collection $A_0 \cap X_0, A_1 \cap X_0, \dots, A_n \cap X_0$, where $A_i \in \mathcal{M}_0$ follows immediately by induction on n. □

Page 188, the first displayed equation should read:

$$B_{n+1} = A_{n+1} \setminus \bigcup_{i=1}^{n} A_i = A_{n+1} \cap \Big(\bigcup_{i=1}^{n} A_i \Big)^c.$$

Page 197, item [C]:

Replace “sumas” with “sums”

Page 197, item [M]:

Replace “Erdodic” with “Ergodic”

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