Discrete Wavelet Transformations:
An Elementary Approach with Applications

Errata Sheet

March 6, 2009

Please report any errors you find in the text to Patrick J. Van Fleet at pjvanfleet@stthomas.edu.

The Errata Stakes

Here is a breakdown of who is winning the race to find the most errors in the text! I haven’t thought far enough ahead about awarding a prize, but something may be on the horizon – especially if I win!

<table>
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Preface

1. Page xiv, change planned I to I planned. (Kristin Pfabe)
2. Page xx, First sentence: Change that to than. (Roger Zarnowski)

Chapter 1

1. Page 3, paragraph 2, line 2: \( \tilde{W}^3 \) should be \( \tilde{W}^T \). The 3 is a footnote marker. (Patrick Van Fleet)
Chapter 2

1. Page 20, Exercise 2.7: The \( \langle u, v \rangle \) should be replaced by \( u \cdot v \). And here is a real howler. The identity to prove should read:

\[
u \cdot v = \frac{1}{4} \|u + v\|^2 - \frac{1}{4} \|u - v\|^2
\]

(Caroline Haddad)

2. Page 21, Problem 2.10: In the definition of \( \|v\|_\infty \), delete \( 1 \leq k \leq n \) under max. (Kristin Pfabe)

3. Page 23, Definition 2.5: Change Dimensions of a Matrix to Dimension of a Matrix. (Roger Zarnowski)

4. Page 38, paragraph 1: replace learned with we will learn to make tenses align. (David Ruch)

5. Page 39, First line: Change \( 2 \times 1 \) to \( 1 \times 2 \). (Roger Zarnowski)

6. Page 41, First line: Change dimensions to dimension. (Roger Zarnowski)

7. Page 46, Exercise 2.33: A’s should be M’s in the last inline formula. (Caroline Haddad)

Chapter 3

1. Page 76, The matrix \( W \) in Problem 3.17 is the white matrix \( W \) defined in Problem 3.14. (David Ruch).

2. Page 77, In Problem 3.19a, replace \( u \) and \( v \) with \( i \) and \( q \), respectively. (David Ruch)

3. Page 79, Definition of Entropy, line 3: The \( a_k \) should be \( a_i \). (Caroline Haddad)

4. Page 79, last line: the word the is missing before the word elements. (Caroline Haddad)

5. Page 81, Definition 3.2: Add \( v \neq 0 \) to the definition. (Kristin Pfabe)

6. Page 83, Definition 3.3, second line: Replace \( u \) and \( v \), by \( A \) and \( B \), respectively. (William Ross)

7. Page 84, Problem 3.22(a): Replace \( c \) any real number with \( c \neq 0 \) any real number. (Kristin Pfabe)

8. Page 84, Problem 3.23: Replace \( c \) any real number with \( c \neq 0 \) any real number. (Patrick Van Fleet)

9. Page 84, Problem 3.24: Part (i) should be Part (h). (Caroline Haddad)
10. Page 85, Problem 3.27: Replace \textit{bpp} with \textit{bits per character}. (Kristin Pfabe)

11. Page 85, Problem 3.27: \( n \geq 4 \). (Qiang Shi)

12. Page 86, Problem 3.29(b): Show that the inequality holds for \( 0 < t \leq 1 \) with equality at \( t = 1 \). (Caroline Haddad and Qiang Shi)

13. Page 92, next to last paragraph, line 5: replace \textit{bit bit} with \textit{bit}. (Caroline Haddad)

\textbf{Chapter 4}

1. Page 100, Line above \textbf{Conjugates}: Change \( 11 + i \) to \( 11 + 7i \). (Kristin Pfabe)

2. Page 114, paragraph before Example 4.5, next to last line: \textit{id} should be \textit{is}. (Caroline Haddad)

3. Page 116, equation (4.15): \textit{kodd} should be \textit{k odd}. (Patrick Van Fleet)

4. Page 122, Problem 4.26(c): No negative sign in front of the \( 2i \). (Caroline Haddad)

5. Page 123, Problem 4.34(b): Replace \( d_k = \overline{c_k} \) with \( d_k = c_k \). (Kristin Pfabe)

6. Page 123, Problem 4.31: plot \( f_n \) for \( n = 1, 2, 5, 10, 50 \). (Caroline Haddad)

7. Page 124, Problem 4.37(b): The integrand for the second integral should be \( e^{2\pi ij\omega/2L} e^{-2\pi ik\omega/2L} \) instead of \( e^{2\pi ik\omega/2L} e^{-2\pi ik\omega/2L} \) (Caroline Haddad)

8. Page 125, Problem 4.37: an \( \omega \) is missing in the complex exponential in the integrand used to define \( c_k \). (Kristin Pfabe)

\textbf{Chapter 5}

1. Page 128, first line in Section 5.1: \textit{OVector} should be replaced with \textit{Vector}. (Caroline Haddad)

2. Page 132, last line: The output for \textbf{y} should be

\[
\textbf{y} = (\ldots, 0, 0, 18, 15, 14, 44, 13, 13, 15, 0, 0, 0, \ldots)
\]

That is, the 8 in the vector should be 13. (David Ruch)

3. Page 137, Exercise 5.13: Delete the sentence “Show that \( \textbf{h} \ast \textbf{x}_m = \textbf{y}_m \).” (Patrick Van Fleet)
4. Page 139, first displayed equation below Definition 5.2: Some subscripts are wrong. The equation should read:

\[ y_n = \cdots = h_0 x_n + h_1 x_{n-1} + h_2 x_{n-2} + h_3 x_{n-3} + \cdots \]

(Caroline Haddad)

5. Page 142, first line after subsection Lowpass Filter Defined: Delete the of in the sentence. (Caroline Haddad)

6. Page 143, the two displayed equations above (5.9): remove the minus signs in the complex exponentials. (Kristin Pfabe)

7. Page 147, Problem 5.16: The definition of \( H(\omega) \) should not have a minus sign in the complex exponential but the definition of \( h_k \) should have a minus sign in the complex exponential. Also change \( dx \) to \( d\omega \). (Kristin Pfabe)

8. Page 148, Problem 5.19: The \( \frac{1}{2} \) should be replaced by \( \pm \frac{1}{2} \). (David Ruch)

9. Page 149, Problem 5.25: \( L \) is an odd positive integer. (Kristin Pfabe)

10. Page 149, Problem 5.27(a): Replace \( (1 + \cos \omega) \) with \( \left( \frac{3}{2} + \cos \omega \right) \). (Kristin Pfabe)

11. Page 152, second sentence: Replace \( \tilde{h} \) with \( \tilde{y} \). (Caroline Haddad)

12. Page 154, second displayed equation: Left side should be \( \frac{1}{2 + e^{-\omega}} \). (David Ruch)

Chapter 6

1. Page 161, Equation (6.3): The subscripts on the \( y_s \) and \( z_s \) should be even - \( y_{-2}, y_0, y_2, y_4, \ldots \) and \( z_{-2}, z_0, z_2, z_4, \ldots \) to keep things consistent with the presentation. (David Ruch)

2. Page 163, last line: replace \( y \) with \( v \). (Kristin Pfabe)

3. Page 165, displayed matrix equation near page top: The values 101 and 60 in the vector should be interchanged. (Kristin Pfabe)

4. Page 170, matrix equation after line 5: The second \( \frac{\sqrt{2}}{2} \) (in front of the vector \( y \)) should not be there. (Kristin Pfabe)

5. Page 170, displayed equations, middle of page: These equations should be

\[ \frac{\sqrt{2}}{2} (y_k + y_{k+N/2}) = v_{2k} \quad \text{and} \quad \frac{\sqrt{2}}{2} (y_k - y_{k+N/2}) = v_{2k-1} \]

(David Ruch and Kristin Pfabe)
6. Page 171, top two lines in Algorithm 6.2: These lines should be

\[ v_{2k-1} = (y_k - y_{k+N/2}) \]
\[ v_{2k} = (y_k + y_{k+N/2}) \]

(David Ruch and Kristin Pfabe)

7. Page 171, Exercise 6.2: Change sitefor to site for. (Kristin Pfabe)

8. Page 171, Exercise 6.5: Change \( g = (g_0, g_1) = (-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}) \) to \( g = (g_0, g_1) = (\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}) \). (Kristin Pfabe)

9. Page 173, first line of Section 6.2: \( \mathbb{R} \) should be \( \mathbb{R}^N \). (David Ruch)

10. Page 174, Last line of Example 6.3: \( WHT \) should be \( HWT \). (David Ruch)

11. Page 180, equations (6.21) and (6.22): \( 2^i-1 \) should be \( 2^i - 1 \) in both equations. (David Ruch)

12. Page 180, last vector on the page: This vector should be

\[
\begin{bmatrix}
  y^{2\ell} \\
  y^{2h} \\
  y^{1h}
\end{bmatrix}
\]

(David Ruch)

13. Page 186, Example 6.8, third line: \( W_{440}^T A \) should be \( AW_{440}^T \). (David Ruch)

14. Page 193, displayed equation: The matrix on the right hand side should not be multiplied by 2. (Caroline Haddad)

15. Page 193, 2 lines below displayed equation: The \( C_1 \) should be \( A \). (Caroline Haddad)

16. Page 196, For loop at top of page: Replace \( k \leq i \) with \( k < i \). (Patrick Van Fleet)

17. Page 204, the bitstream length of 98,304 should be \( 8 \times 98,304 = 786,432 \). (Caroline Haddad)

18. Page 215, first line: Replace \( W_{384} \) with \( W_{512} \). (Kristin Pfabe)

19. Page 215, first line after Table 6.7: Change the second \( V \) to \( D \). (Caroline Haddad)

20. Page 217, Problem 6.26(a), last line: Replace \( k + N/2 \) by \( k \) as the subscript for \( d \). (Patrick Van Fleet)
21. Page 220, second paragraph, second line: eliminate the word *does*. (Caroline Haddad)

22. Page 220, Problem 6.31(d): Change the first $\mathcal{H}$ to $\mathcal{B}$. (Caroline Haddad)

23. Page 220, Problem 6.31(e): Change *three* to *any*. (Patrick Van Fleet)

Chapter 7

1. Page 223, second paragraph: The vector $\mathbf{v}$ should be $\mathbf{v} = [100, 102, 200, 202]^T$ and $\tilde{\mathbf{v}}$ should be $\tilde{\mathbf{v}} = [-1, 1, -1, 1]^T$. (Kristin Pfabe)

2. Page 223, next to last line: A space is needed between *be* and $\tilde{\mathbf{y}}$. (Roger Zarnowski)

3. Page 224, Third line in Section 7.1: $W^T$ should be $W_X^T$. (Kristin Pfabe)

4. Page 229, Equation (7.17): $h_0 - h_1 - ch_1 + ch_0 = 0$ should be $h_0 - h_1 - ch_1 - ch_0 = 0$. (Kristin Pfabe)

5. Page 231, first paragraph, next to last line: after *approach*, insert *0* at. (Caroline Haddad)

6. Page 232, first line: Replace *Now if use* with *Now if we use*. (Kristin Pfabe)

7. Page 232, first indented equation after (7.25): The $3 + \sqrt{3}$ should be $3 - \sqrt{3}$. (Kristin Pfabe)

8. Page 233, sentence below (7.31): change (7.17) to (7.15) (Kristin Pfabe)

9. Page 234, second boxed equations: $g_0$ should be $g_0 = h_3 = \frac{1}{4\sqrt{2}}(1 - \sqrt{3})$ and $g_1$ should be $g_1 = -h_2 = -\frac{1}{4\sqrt{2}}(3 - \sqrt{3})$. (Kristin Pfabe)

10. Page 236, first indented equation below (7.38): Replace $e^{5i\omega}$ with $e^{ik\omega}$. (Kristin Pfabe)

11. Page 241, first sentence of last paragraph: change *slight* to *slightly*. (Kristin Pfabe)

12. Page 248, Problem 7.13: the identities in parts (a) and (c) are missing negative signs on the right hand sides. They should be $G(\omega) = -e^{-3i\omega}H(\omega + \pi)$ and $G(\omega) = -e^{-3i\omega}H(\omega + \pi)$, respectively. (Kristin Pfabe)

13. Page 257, first displayed equation: Replace ($-i$) by $i$. (Kristin Pfabe)

14. Page 258, last paragraph: Change (7.63), (7.69), (7.80), (7.71), and (7.75) to (7.76)–(7.80). (Kristin Pfabe)

15. Page 260, Table 7.4: Change last two entries from 6 to 8. (Kristin Pfabe)
16. Page 261, first displayed equation of $Q(z)$: The right hand side should be multiplied by $\frac{1-\sqrt{3}}{4\sqrt{2}}$. The right hand side of the second displayed equation of $Q(z)$ should be multiplied by $\frac{1+\sqrt{3}}{4\sqrt{2}}$. (Patrick Van Fleet)

17. Page 263, Problem 7.21(c): Insert $j+k$ between the and odd and also between the and even. (Kristin Pfabe)

18. Page 264, Problem 7.24: The identity to prove is missing a negative sign on the right hand side. It should read: show $G(\omega) = -e^{i\omega L}H(\omega + \pi)$. (Kristin Pfabe)

19. Page 266, Matrices $H_6$ and $H_8$ need to have the horizontal divider moved up 1 and 2 rows, respectively. (Kristin Pfabe)

20. Page 268, Top matrix product: The first element of the column vector is $v_1$ not $\ell v_1$. (Kristin Pfabe)

21. Page 272, Second paragraph, last line: $y_{N/2}$ should be $y_{N/2}$. (Kristin Pfabe)

22. Page 273, First paragraph, second line: Replace 2, 4, and 6 by 2, 3, and 4. (Kristin Pfabe)

23. Page 274, second line: Change nonwrapping row $k$ to $k$th nonwrapping block. (Kristin Pfabe)

24. Page 274, Equations (7.99) and (7.100): The upper limits on the summations should be $\frac{L+1}{2} + k - 1$ instead of $L+1/2 + k$. (Kristin Pfabe)

25. Page 274, Table 7.7, second row, second column: Change $h$ to $o$ in summand. (Kristin Pfabe)

26. Page 275, Line 5: Insert the before general. (Kristin Pfabe)

27. Page 275, Equation (7.102): The subscript of $o$ should be $j$ instead of $\frac{L+1}{2} - k + j$. (Kristin Pfabe)

28. Page 275, Equations (7.103) and (7.104): The second summations in each equation should have subscript $j$ for $o$ and $e$, respectively. (Kristin Pfabe)

29. Page 276, Algorithm 7.2 description: The second entry in $o$ should be $f_3$ instead of $f_2$. (Kristin Pfabe)

30. Page 276, Algorithm 7.2, last loop: The upper limit should be $r + k - 1$ instead of $r - k$. (Kristin Pfabe)

31. Page 276, Last line: Replace $v_{L+2x-1}$ with $v_{L+2k-1}$. (Kristin Pfabe)

32. Page 277, Second to last loop: Swap the $o$ and $e$. (Kristin Pfabe)
33. Page 277, Last loop: The index on $o$ and $e$ should be $j$ instead of $r - k + j$. (Kristin Pfabe)

Chapter 8

1. Page 281, second paragraph, second line: insert obtained between were and simply. (Caroline Haddad)

2. Page 281, third paragraph, second sentence: delete the word that. (Kristin Pfabe)

3. Page 286, paragraph under Definition 8.2, third sentence: change ways to way. (Kristin Pfabe)

4. Page 290, rows in the middle of the page: Remove all terms that have a subscript 4 and delete the last row. (Kristin Pfabe)

5. Page 293, equation (8.22) - the right hand side is missing a negative sign. It should be $G(\omega) = -e^{i\omega}H(\omega + \pi)$. (Kristin Pfabe)

6. Page 294, sentence above equation (8.25): change the to to on. (Kristin Pfabe)

7. Page 294, equation leading to (8.26): The second term in the right hand sides of the second and third lines should have $e^{in(\omega + \pi) + b}$ instead of $e^{n\omega + b}$. (Kristin Pfabe)

8. Page 297, third indented equation: This should be $G(\omega) = -\sqrt{2}i e^{\frac{i\omega}{2}} \sin\left(\frac{\omega}{2}\right)$. (Caroline Haddad)

9. Page 301, text below equation (8.41): $Q_k$ should be $Q_K$. (Kristin Pfabe)

10. Page 302, equation after (8.46): The denominator should be $2^K e^{iK\omega}$. (Kristin Pfabe)

11. Page 306, equation (8.57): $e^{-i\omega}$ should be $e^{-i\omega}$. (Kristin Pfabe)

12. Page 308, equation (8.59) - upper sum limits should be 7 not 11. (Patrick Van Fleet)

13. Page 309, fourth paragraph: The paragraph starts with In the case $K = 2$. Change the three $\frac{5}{2}$'s to $\frac{3}{2}$'s. (Kristin Pfabe)

14. Page 309, last equation: The right hand side is missing a negative sign. It should be $G(\omega) = -e^{i(2K-1)\omega}H(\omega + \pi)$. (Kristin Pfabe)

15. Page 314, Problem 8.14: Change to Use Lemma 8.1 to verify (8.47). (Kristin Pfabe)

16. Page 314, Problem 8.17: In part (b), change $e^{-i\omega}$ to $e^{i\omega}$. In part (d), change use part (b) to use part (c). (Kristin Pfabe)

8
Chapter 9

1. Page 319, Paragraph above Figure 9.1: Delete the last sentence For this example, we use $\sigma = 18$. (Kristin Pfabe)

2. Page 325, last sentence: Change Theorem A.7 to Proposition A.7. (Kristin Pfabe)

3. Page 329, fourth line: after very sparse!, insert the phrase the highpass portion of. (Kristin Pfabe)

4. Page 331, fourth line: change at to as. (Kristin Pfabe)

5. Page 331, sentence before Figure 9.8: Change is to are. (Kristin Pfabe)

6. Page 331, sentence after Figure 9.8: Insert inverse before wavelet transformation. (Kristin Pfabe)

7. Page 334, Problem 9.9(d): $j, k$ run from 1 to $N$, not 1 to 300. (Kristin Pfabe)

8. Page 339, fourth line: change depend to depends. (Kristin Pfabe)

Chapter 10

1. Page 351, fourth line from bottom: Change $H'(\pi) = 0$ to $H(\pi) = 0$. (David Ruch)

2. Page 352, third paragraph from bottom, last sentence: Delete the before analyze. (Kristin Pfabe)

3. Page 355, formula for $c$: Change $\tilde{h}_{-1}$ to $\tilde{h}_1$. (Kristin Pfabe)

4. Page 355, third equation in (10.3): Change $\tilde{h}_{-1}$ to $\tilde{h}_1$. (Kristin Pfabe)

5. Page 356, Theorem 10.1: Delete the and in front of whose. (Kristin Pfabe)

6. Page 359, equation above (10.29): Change $\tilde{H}(\omega)$ to $\tilde{H}(\omega)$. (Kristin Pfabe)

7. Page 360, Corollary 10.1, change Then to then. (Kristin Pfabe)

8. Page 363, $\tilde{W}_8$ matrices: The seventh and eighth rows in each matrix should be shifted cyclically one more unit to the right. (Kristin Pfabe)

9. Page 366, Last line of Proposition 10.3: Change the second odd to even. (Kristin Pfabe)

10. Page 367, Corollary 10.2, last sentence: delete the comma and replace then $p \ldots$ and with and we define $p \ldots$, then. (Kristin Pfabe)
11. Page 367, equation (10.36): $h_0$ and $h_1$ throughout the identity should be replaced with $\tilde{h}_0$ and $\tilde{h}_1$, respectively. (Kristin Pfabe)

12. Page 370, Problem 10.13: Part (c): Change $n = -1$ to $n = 1$ and $b = 0$ to $b = \pi$. (David Ruch)

13. Page 370, Problem 10.13: Part (e) should refer to Corollary 10.1 instead of 10.2. Part (f) - change For to Find.

14. Page 373, paragraph that starts with Unfortunately: Change $e^{i\omega /2}$ to $e^{i\omega /2}$. (Kristin Pfabe)

15. Page 374, equation (10.42) - write $N/2$ as a fraction. (Patrick Van Fleet)

16. Page 375, The splines used should not be centered. $B_0$ should be defined as the characteristic function on $[0, 1)$ and (10.45) should be an integral over the interval $[0, 1)$ as well. The triangle function $B_1(t)$ should be replaced with $B_1(t - 1)$ and the figures in Figure 10.1 should be translated $\frac{1}{2}$ and 1 unit right, respectively. (Patrick Van Fleet)

17. Page 376: Paragraph above (10.50): Two occurrences of $(1, \frac{1}{2}, 1)$ should be changed to $(\frac{1}{2}, 1, \frac{1}{2})$. (Caroline Haddad)

18. Page 376: The dilation equation (10.48) should read

$$B_0(t) = 1 \cdot B_0(2t) + 1 \cdot B_0(2t - 1)$$

(Kristin Pfabe)

19. Page 376: The dilation equation (10.49) should read

$$B_1(t) = \frac{1}{2} B_1(2t) + 1 \cdot B_1(2t - 1) + \frac{1}{2} B_1(2t - 2)$$

and the functions in Figure 10.2 should be moved so that they are supported in the interval $[0, 2]$. Equation (10.50) should read

$$B_{\tilde{N}}(t) = \sum_{k=0}^{\tilde{N}+1} 2^{\tilde{N}} \binom{\tilde{N} + 1}{k} B_{\tilde{N}}(2t - k)$$

(Patrick Van Fleet)

20. Page 377, equation (10.52): all $h_k$ need tildes. (Kristin Pfabe)

21. Page 380, two lines above $\tilde{W}_{10}$: delete make to. (Kristin Pfabe)

22. Page 381, second matrix: Change all $\frac{3\sqrt{2}}{8}$ to $\frac{3\sqrt{2}}{4}$. (Kristin Pfabe)
23. Page 396, Example 10.11, second display equation for $H(\omega)$: Change $-\frac{3\sqrt{2}}{8}(2\cos^2(\omega) - 1)$ to $-\frac{3\sqrt{2}}{8}(2\cos^2(\omega) - 1)$. (Kristin Pfabe)

24. Page 398, Equation (10.70): The middle term in the identity is missing a factor of $\overline{H(\omega)}$. (Caroline Haddad)

25. Page 398, Equation (10.71): The middle term in the identity is missing a factor of $\overline{H(\omega + \pi)}$. (Caroline Haddad)

26. Page 399, second paragraph: replace even functions by $2\pi$-periodic functions. (Kristin Pfabe)

27. Page 399, footnote, last line: a space is needed between of and $h$. (Kristin Pfabe)

28. Page 400, last displayed equation for $P(t)$ at the bottom of page: The top argument in the binomial coefficient should be $K - 1 + j$ instead of $K - j + 1$. (Kristin Pfabe)

29. Page 401, two lines above (10.76): Replace We now use (10.74) with $\tilde{\ell} = 2$ with We now use (10.73) and (10.74) with $\tilde{\ell} = \ell = 2$. (Kristin Pfabe)

30. Page 401, equation (10.77): The first occurrence of $-0.373391i$ should be 0.373391i. (Kristin Pfabe)

31. Page 401, last displayed equation: An $= \overline{H(0)}$. (Kristin Pfabe)

32. Page 404 Problem 10.39: Replace 10.39 by 10.38 and insert the word to before verify. (Caroline Haddad).

**Chapter 11**

1. Page 410, second expression for $y_1$: The last four terms on the right hand side should use $v_1, v_2, v_3$, and $v_4$ instead of $v_0, v_1, v_2$, and $v_3$, respectively. (Kristin Pfabe)

2. Page 412, first paragraph, last line: Change decrease to decreases. (Kristin Pfabe)

3. Page 413, displayed equations for $z_1, z_2, z_3, z_{N/2}$: The indices of the last components in the $w$ vector should be $w_{2L+1}, w_{2L+3}, w_{2L+5}, w_{2L+2(N/2)−1}$, respectively. (Kristin Pfabe)

4. Page 414, displayed equations for $z_1, z_2, z_3, z_{N/2}$: The indices of the last components in the $w$ vector should be $w_{2L}, w_{2L+2}, w_{2L+4}, w_{2L+2(N/2)−2}$, respectively. (Kristin Pfabe)

5. Page 415, Algorithm 11.1 - the first time $w$ is defined, there is a mistake on the indices. It should be

$$w = \text{Join}[\text{Join}[(v_{N-(L-1)+1}, \ldots, v_N), v], (v_1, \ldots, v_{L-1})]$$

(Patrick Van Fleet)
6. Page 416, Problems 11.4 and 11.5: Change \( N = 24 \) and \( \tilde{G}_6 \) to \( \tilde{G}_{12} \). (David Ruch)

7. Page 420, Second matrix, first row: the second zero should be \( h_6 \). (Kristin Pfabe)

8. Page 421, first line: \( H_8 s \) should be \( H_8^T s \). (Kristin Pfabe)

9. Page 421, second line: Change odd to even. (Kristin Pfabe)

10. Page 421, paragraph above equation for \( q_{2k-1} \), third line: Change \( a \) to \( c \). (Kristin Pfabe)

11. Page 421, next to last paragraph, second line: omit \( and \ s_2 \). (Kristin Pfabe)

12. Page 426, line above (11.19): Change \( h^o \) to \( h^e \). (Kristin Pfabe)

13. Page 427, last line: Change \( h^e \) to \( h^o \). (Kristin Pfabe)

14. Page 428, Equation (11.21): Change \( h^o \) to \( h^e \). (Kristin Pfabe)

15. Page 428, third line after equation for \( g \): change \( h^e \) and \( h^o \) to \( g^e \) and \( g^o \). (Kristin Pfabe)

16. Page 429, Equation (11.25) should read \( p = \lfloor \frac{L}{2} \rfloor \) and \( a = \lfloor \frac{L-2}{2} \rfloor \). (Patrick Van Fleet)

17. Page 429, Equation (11.26) should read \( p = \lfloor \frac{L-1}{2} \rfloor \) and \( a = \lfloor \frac{L-1}{2} \rfloor \). (Patrick Van Fleet)

18. Page 429, Displayed equation for \( c \): Change two occurrences of \( t_N \) to \( t_{N/2} \). Also enclose vector components with \([\) instead of \( ( \) and add a transpose to the last \( ] \). (Kristin Pfabe)

19. Page 431, top two lines: Change \( p = \lfloor \frac{L-2}{2} \rfloor \) and \( a = \lfloor \frac{L+1}{2} \rfloor \) to \( p = \lfloor \frac{L-1}{2} \rfloor \) and \( a = \lfloor \frac{L}{2} \rfloor \), respectively. (Kristin Pfabe)

20. Page 432, Definitions of \( \ell \) and \( m \): Change \( \ell = L \) to \( \ell = L - i \) and \( m = L + 1 \) to \( m = L + 1 - i \). (Kristin Pfabe)

21. Page 432, The first time \( p \) and \( a \) are defined (above the line defining \( c \)), they should be \( p = \lfloor \frac{L}{2} \rfloor \) and \( a = \lfloor \frac{L-2i}{2} \rfloor \). (Patrick Van Fleet)

22. Page 432, The second time \( p \) and \( a \) are defined (above the line defining \( d \)), they should be \( p = \lfloor \frac{L-1}{2} \rfloor \) and \( a = \lfloor \frac{L+1-2i}{2} \rfloor \). (Patrick Van Fleet)

23. Page 432, The last \texttt{For} statement at the bottom of the page - the upper limit should be \( \ell \) instead of \( m \). (Patrick Van Fleet)

24. Page 433, The \texttt{For} statement at the top of the page - the upper limit should be \( m \) instead of \( \ell \). (Patrick Van Fleet)
25. Page 434, Exercise 11.7 (d) and (e). Note that (11.25) and (11.26) defined in the text are incorrect - see previously noted corrections. (Patrick Van Fleet)

26. Page 437, three lines from bottom: Change $(-1)^k h_k$ to $(-1)^k h_{1-k}$. (Kristin Pfabe)

27. Page 438, second matrix: Change three occurrences of $h_1$ to $g_2$. (Kristin Pfabe)

28. Page 441, equation (11.36): Change all $y$’s to $z$’s. (Kristin Pfabe)

29. Page 442, last equation: left hand side should be $a_{n+N-1}$. (Kristin Pfabe)

30. Page 443, first equation: left hand side should be $a_{n+N-1}$. (Kristin Pfabe)

31. Page 443, sixth line: Change $h$ to $\tilde{h}$. (Kristin Pfabe)

32. Page 444, Displayed equation for $\tilde{h}$: Insert two zeros after the first $\ldots$ and two zeros before the second $\ldots$ and add tildes to the subscripts $L-1$ so that they are $L-1$. (Kristin Pfabe)

33. Page 445, next to last line of Proposition 11.3: Change $g_k$ to $\tilde{g}_k$. (Kristin Pfabe)

34. Page 445, 446, Add two zeros after the first $\ldots$ and before the second $\ldots$ in the definition of $\tilde{g}$ in Propositions 11.3 and 11.4. (Kristin Pfabe)

35. Page 447, Displayed equation for $v$ in Example 11.5: last element in last vector should end with $-h_0 v_8$ instead of $+h_0 v_8$. (Kristin Pfabe)

36. Page 447, Equation (11.44): The row 8, column 8 entry should be $-h_0$ instead of $h_0$. (Kristin Pfabe)

37. Page 447, Sixth line after (11.44): insert $a$ between for and two-dimensional. (Kristin Pfabe)

38. Page 450, Line below the displayed equation for $y$: Replace $(-1)^k h_k$ with $(-1)^k h_{1-k}$. (Kristin Pfabe)

39. Page 451, paragraph after displayed formula for $z$: Change $v_1, \ldots, v_4$ to $v_1, v_2, v_3$. (Kristin Pfabe)

40. Page 451, Equation (11.48): Change the two occurrences of $h_{10} v_4$ to $h_{1} v_{10}$. (Kristin Pfabe)

41. Page 451, Equation (11.49): Rewrite $-h_1 v_2 + h_3 v_2$ to $(h_3 - h_1) v_2$ in row 1 and $h_1 v_2 - h_3 v_2$ to $(h_1 - h_3) v_2$ in row 12. (Kristin Pfabe)

42. Page 455, Problem 11.17 Hint: For consistency, rewrite $\langle \tilde{w}^k, \tilde{w}^j \rangle$ as $\tilde{w}^k \cdot \tilde{w}^j$. (Kristin Pfabe)
Chapter 12

1. Page 461, Definition of $u_{jk}$: When $j = 1$, $u_{jk} = \sqrt{2}/4$. (Kristin Pfabe)

2. Page 471, Paragraph preceding (12.6): Change $b = \pi$ to $b = 0$ and delete the phrase and using the fact that $e^{\pi i} = -1$. (Kristin Pfabe)

3. Page 471, Equation (12.6): Replace the $e^{\pi i}$ by $(-1)$ in both $\hat{g}_k$ and $g_k$. (Kristin Pfabe)

4. Page 472, Figure 12.7: Replace $\mathcal{D}^1$ with $\mathcal{H}^1$ in the upper right hand corner of the figure. (Kristin Pfabe)

5. Page 473, Equation (12.10): Change the second occurrence of $d_{1V}$ to $d_{1D}$. (Kristin Pfabe)

6. Page 473, Equation (12.10): Change $\frac{1}{2}i$ to $\frac{1}{2}$. (Kristin Pfabe)

7. Page 473, Last two lines: Change second occurrence of $d_{1V}$ and $d_{2V}$ to $d_{1D}$ and $d_{2D}$, respectively. (Kristin Pfabe)

8. Page 477, Displayed equations for $o$ and $e$: Change four occurrences of parentheses to brackets. (Kirstin Pfabe)


10. Page 482, Example 12.4: Change $\frac{15}{2} + \frac{15}{2}$ to $8 + 8$ when computing $s_1^*$, $\frac{5}{2} + \frac{15}{2}$ to $3 + 8$ when computing $s_2^*$, and $6 + \frac{5}{2}$ to $6 + 3$ when computing $s_3^*$. (Kristin Pfabe)

11. Page 482, Equation (12.22): The argument of the floor function should be $\frac{1}{4}(d_k^* + d_{k-1}^*) + \frac{1}{2}$. (Kristin Pfabe)

12. Page 483, two lines below Equation (12.24): delete the word from. (Kristin Pfabe)

13. Page 486, second line in Sectio 12.4: Change first occurrence of lossless to lossy. (Kristin Pfabe)

14. Page 492, Figure 12.16 caption - should be upper left instead of bottom left. (Patrick Van Fleet)

Appendix A

1. Page 494, last equation: A $(0 - 2)^2$ is missing in the computation so that the variance is actually 128.4. (Kristin Pfabe)

2. Page 499, Second line in Section A.3: change that to i.e.,. (Kristin Pfabe)
3. Page 502, fifth line: Change assumes that a value is to assumes a value in. (Kristin Pfabe)

4. Page 504, first indented equation: power on $(4 - y)$ should be $\frac{3}{2}$ instead of $\frac{2}{3}$. (Kristin Pfabe)

5. Page 506, 5 lines above Example A.10: Change we’re to we. (Kristin Pfabe)

6. Page 509, Example A.11: First $\text{Var}(X)$ should be $\frac{1}{12}$ instead of $\frac{2}{3}$. (Kristin Pfabe)