Digital Image Processing

4th GLOBAL Edition

Gonzalez and Woods

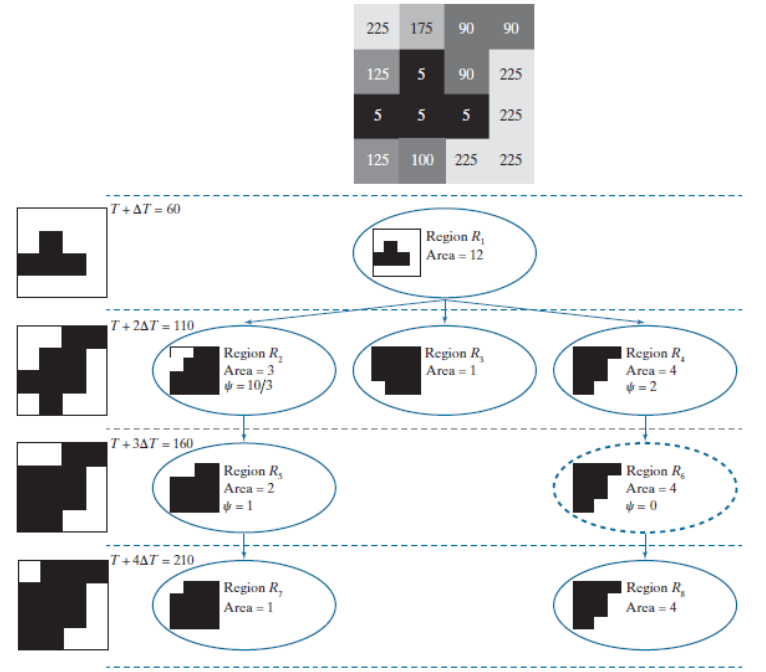
Pearson/Prentice Hall

June 17, 2023

CORRECTIONS

Some of the corrections listed may already be incorporated in your printing of the book

Page	Reads	Should Read
71, six lines from bottom	$W/2$	$1/2W$
154-155	In Eq. (3-32) we made the implicit assumption that 1-D kernels are of dimension 1-by-*n*. Change *a* to *b* in the limits for consistency with Eq. (3-31). Then, in the 2nd line of pg 155, make the change $a=0$ and $b=2$, again for consistency.	
162, 2nd line below Eq. (3-44)	. . . a respectable 5.2.	. . . a respectable 5.5.
212, 1st eq. in Ex 4.2	$...dt = e^{-j2\pi\mu}$	$...dt = e^{-j2\pi\mu 0} = e^{0} = 1$
230, Eq. (4-52)	$\delta(t,z) = \begin{cases} 1 & \text{if } t = z = 0 \\ 0 & \text{otherwise} \end{cases}$	$\delta(t,z) = \begin{cases} \infty & \text{if } t = z = 0 \\ 0 & \text{otherwise} \end{cases}$
254, equation, middle of page.	$(f \star h)(x) = \sum_{m=0}^{300} f(x)h(x-m)$	$(f \star h)(x) = \sum_{m=0}^{300} f(m)h(x-m)$
255, labels in Figs. 4.27(e),(j).	$(f \star g)(x)$	$(f \star h)(x)$
295, Eq. (4-147)	The equation should read: $H(u,v) = (\gamma_H - \gamma_L)[1 - e^{-cD^2(u,v)/D_0^2}] + \gamma_L$	
297, below Eq. (4-148)	In the text below Eq. (4-148), lines 3, 6, and 12: replace "bandpass" with "bandreject"	
300, Eq. (4-154)	Both instances of *n* in the denominator should be 2*n*.	
306, first line	$W_M^{u+K} = W_K^u$	$W_K^{u+K} = W_K^u$
307, Eq. (4-172)	$\alpha(n) = M \log_2 M$	$\alpha(p) = M \log_2 M$
360, Eq. (5-84)	Upper limit in last summation reads $M-1$	Replace with $N-1$
463, Fig. 6.29 Caption	(d), (e)-(f) should read: (d) The required CMY mapping function. (e)-(f) The required CMYK mapping functions.	
468, top side comment box	Change $s_{3,0}$ to $s_{0,3}$.	
468, Eq. (7-22)	The elements of the second column vector should be: $s_{0,u}, s_{1,u}, ..., s_{N-1,u}$	
477, 3rd line from top	$x = 0,1,...,7$	$x = 0,1/8,...,7/8$
478, Step 3 of Example 6.19	The components of the column vector **h** should be 1, $e^{-j\pi/8}$, $e^{-j\pi/4}$, and $e^{-j3\pi/8}$	
501, last parag, penultimate line	. . . Fig. 7.16(b)	. . . Fig. 7.17(b)
518, Eq. (7-150)	$g_1(n) = (-1)^n h_0(n)$	$g_1(n) = (-1)^{n+1} h_0(n)$
520, Eq. (7-152)	Unreadable	$\varphi(x,y) = \varphi(x)\varphi(y)$
542, Example 8.1	In the first eq. of the example, after the second term, insert the term "+ 0.25(3)"	
543, Table 8.1	Change the 2rd, 3rd, and 4th entries in the Code 1 col to: 10000000, 11000100, and 11111111	
770, 7 lines from bottom	set, *Q*, of observations . . .	set of *Q* vector observations . . .
770, 2 lines from bottom	. . . } be set of vector observations	. . . } be a set of vector observations
771, 3 lines above Eq. (10-85)	. . . partition the set *Q* of observations . . .	. . . partition the set of *Q* observations . . .
773, Fig. 10.50, caption line 1	600×480	600×800
781, last line	. . . Eq. (10-4)	. . . Eq. (10-97)
804, Problem 10.6	(c)	There should be no part (c).

842, Eq. (11-23)	So that the eq will match Fig. 11.21, change it to: eccentricity $= \sqrt{\lambda_1^2 - \lambda_2^2}/\lambda_1 = \sqrt{1-(\lambda_2/\lambda_1)^2}$ $\lambda_1 \geq \lambda_2$	
842, 1st line below Eq. (11-23)	. . . For a line $\lambda_1 = 0$	. . . For a line $\lambda_2 = 0$
638, Fig. 9.3c	Elements (3,5), (3,11), (5,5), and (5,11) should be 0 (white in the figure)	
831, 7th line of Example	Figure 11.14(c) shows …	Figure 11.14(d) shows …
876 2nd parag. replace line 5	the pixels above the threshold as white and pixels at or below the threshold as	
876 lines 6 and 7	… (all pixel values are at or above 0).	… , with 0-valued pixels showing as black.
879 3rd parag line 7	… that do change	… that do not change
975, 3rd line from top	… $\delta_{x,y}(\ell+1)$	$\delta_{u,v}(\ell+1)$
980, last line of last parag	99.9%	99.4%
878, Fig. 11.51	Fig. 11.51 should look like this: 	
927, Example 12.5	The multiplier in front of m1 and m2 should be $1/4$ instead of $1/3$	
938, 4th line	. . . positive (i.e., 6)	. . . positive (i.e., 12)
947, footnote, eq. in 3rd line	...exp$[z_i(L)]$	...exp$[z_k(L)]$
959, 3rd line from bottom	0.02	0.5
962, 2nd parag., 1st line	1887	1897
972, Eq. (12-88)	The superscripts in the last summations on the second line should be (3) (3) instead of (2) (2)	
987, 3rd parag. 2nd line	. . . *universality*	. . . *universal*

Possible Missing References

Roberts, L. G. [1965]. “Machine Perception of Three-Dimensional Solids,” in *Optical and Electro-Optical Information Processing*, Tippet, J. T. (ed.), MIT Press, Cambridge, MA.

Robertson, A. R. [1977]. “The CIE 1976 Color Difference Formulae,” *Color Res. Appl.*, vol. 2, pp. 7–11.

Rosenblatt, F. [1959]. “Two Theorems of Statistical Separability in the Perceptron,” In *Mechanisation of Thought Processes: Proc. of Symposium No. 10*, held at the National Physical Laboratory, November 1958, H. M. Stationery Office, London, vol. 1, pp. 421–456.

Rosenblatt, F. [1962]. *Principles of Neurodynamics: Perceptrons and the Theory of Brain Mechanisms*, Spartan, Washington, D. C.

Rosenfeld, A. and Kak, A. C. [1982]. *Digital Picture Processing*, vols. 1 and 2, 2nd ed., Academic Press, NY.

Ross, J. C. [2011]. *The Image Processing Handbook*, 6th ed., CRC Press, Boca Raton, FL.

Ross, S. M. [2014]. *A First Course in Probability*, 9th ed., Pearson Prentice-Hall, Upper Saddle River, NJ.

Russo F. and Ramponi, G. [1994].“Edge Extraction by FIRE Operators,” *Fuzz-IEEE ’94*, vol. 1, pp. 249–243, IEEE Press, New York.

Rumelhart, D. E., Hinton, G. E., and Williams, R. J. [1986]. “Learning Internal Representations by Error Propagation,” In *Parallel Distributed Processing: Explorations in the Microstructures of Cognition, Vol. 1: Foundations*, Rumelhart, D. E., et al. (eds.), MIT Press, Cambridge, MA, pp. 318–362.