CHAPTER 1

3 Fourth equation:

$$k_u \in [2\pi \frac{n}{2L}, 2\pi \frac{n+1}{2L}]$$
$$k_u \in [-2\pi \frac{n+1}{2L}, -2\pi \frac{n}{2L}],$$

9 Last equation:

$$\begin{aligned} S(\omega) &= \frac{1}{2\pi} \ P(\omega) \ * \ H(\omega) \\ &= \frac{1}{2\pi} \int_{-\infty}^{\infty} P(\alpha) \ H(\omega - \alpha) \ d\omega, \end{aligned}$$

12 First paragraph: ... We will deal with PM/FM signals whose Fourier transforms ...

15 Third equation:

$$\omega_0 \equiv \frac{2\pi}{t_2 - t_1},$$

16 Last paragraph: ... we will revisit PM waves in Section 1.11, and ...

18 Last paragraph: ... Thus, one may recover $P(\omega)$ from the delta-sampled signal ...

39 Second paragraph: ... we are not capable of reconstructing $F_0(k_x)$ from ...

54 Equation (1.31):

$$F_b(k_x) \equiv F(k_x) \ \exp(-j k_x X_1). \tag{1.31}$$

70 Second paragraph: ... a line spectrum with a bandwidth (which is dictated by ω_1) that is ...

88 Second equation:

$$A_1(\ell\omega_2) = A_\ell.$$

89 Last equation:

$$\begin{aligned} \Lambda(t,0) =& E\Big[\ a(t) \ a^*(t) \Big] \\ &= |b(t)|^2 + \frac{r_{a_0}(0)}{t_3} \big[g(0) - |g(t)|^2 \big]. \end{aligned}$$

106 First paragraph: ... another chirp signal in the u domain [7] (see Section 1.2): ...

107 First paragraph: Equation (1.64) is a valid approximation ...

110 Second paragraph: ... Figure 1.31a shows this for a target with $y_0 = 0$ (broadside target) where ...

115 Fourth paragraph: *... and Section 4.9 (Doppler Beam Sharpened SAR). We will ...*

CHAPTER 2

135 Fourth equation:

$$f_p(\theta, r) = \begin{cases} 1 & 0 \le r \le |R| \\ 0 & \text{otherwise.} \end{cases}$$

136 Fourth equation:

$$\begin{aligned} f(x,y) &= \begin{cases} 1 & \text{for } |x| \le a \text{ and } |y| \le b \\ 0 & \text{otherwise} \end{cases} \\ &= \text{rect}(\frac{x}{2a})\ \text{rect}(\frac{y}{2b}), \end{aligned}$$

157 Fifth equation:

$$\delta(x,y) = J(x,y)\ \delta(x',y')$$

$$\delta(x',y') = J'(x',y')\ \delta(x,y)$$

175 Last paragraph: ... the selection of the sample spacing in the measurement domain ...

175 Before the last equation: ... for all available (k_x, k_y) and $(m,n) \ne (0,0)$, where ...

184 Item iv: ... point spread function that depended on the target's spatial coordinates ...

CHAPTER 3

190 Last paragraph: ... (like what a black hole was presumed to be) ...

194 Third paragraph: *... The support band for $H(k_u, \omega)$ in the k_u domain is approximated to be the main lobe of the sinc function ...*

202 Middle of the page: ... a number between one to two with the right side of this constraint ...

215 Second paragraph: ... Based on the system model in (3.18)-(3.19), for a given ...

215 Third paragraph: ... to detect and/or image moving targets ...

219 First equation:

$$\tau(u,\theta) \equiv \frac{u \sin\theta}{c}, \tag{3.20}$$

245 Second paragraph: ... where the objectives were to image and determine the velocity of ...

CHAPTER 4

270 Second paragraph: ... we also denote the normalized version of $s(u,\omega)$ by $P(\omega)$, that is, ...

282 Last paragraph: ... this form of bandpass spatial frequency coverage provides information only regarding the *surface* or *shape* of the object under study (see the discussion on point spread function in Section 2.7).

293 Last equation:

$$t_2 \equiv \frac{\Delta_u}{v_R}.$$

301 Middle of the page: ... Thus, the inverse equation (4.31) modifies the recorded data for each u based on a variable range and cross-range phase function, i.e., $2k\cos\theta_1 X(u) + 2k\sin\theta_1 Y(u)$, prior to the ...

316 Figure 4.19b should be rotated by 90 degrees counterclockwise.

317 Figure 4.19c should be rotated by 90 degrees counterclockwise.

317 Last paragraph: ... this results in a *motion-induced* synthetic aperture ...

334 The two figures of Figure 4.22 should be switched.

338 In Figure 4.25, a typo in Transmitting Radar's.

340 Last paragraph: ... the round-trip phase delay for the signal echoed ...

CHAPTER 5

384 Second paragraph: ... In the presence of heavy dynamic clutter, ...

389 Before equation (5.59): ... where $I_n(\cdot)$ is an indicator (band) function defined by (see the discussion on finite aperture effects in Chapter 4) ...

371 Last paragraph: ... With $Y_1 = 0$ and $\sqrt{A^2 + B^2} \ll v_R$, the linear parameters ...

CHAPTER 6

446 After the last equation: ... This is depicted in Figure 6.3 for a broadside and an off-broadside target. ...

455 Last two equations:

$$\frac{\partial}{\partial k_u}\left[\sqrt{k^2 - k_u^2}\; x(y)\right] = \frac{-k_u}{\sqrt{k^2 - k_u^2}} x(y).$$

$$y_e(y) \approx \frac{-y}{X_1 + x(y)} x(y).$$

489 Last paragraph: ... Moreover, we have $-2L \le u_i - u_j \le 2L$. ...

490 First sentence: ... Thus, the resolution in the y domain is $(\lambda = \frac{2\pi}{k})$ ...

493 Last paragraph: ... In practice, the extent of the array is much smaller than the ...

498 First paragraph: ... The spectrum of $\mathbf{a}(u)$ is found via the following: ...

484 Third paragraph: ... The analog circuitry of the receivers is tuned ...

CHAPTER 7

506 Second paragraph: ... We now examine the measurement database when only one of the elements of the array ...

513 Second paragraph: ... Moreover, similar to the one-dimensional transmission imaging examined in Chapter 1, a wide-band source does not provide ..

516 Last equation:

$$\mathcal{F}_{(v)}\Big[\exp[jk\sqrt{(X_2-x)^2+(v-y)^2}]\Big] = \exp[-j\sqrt{k^2-k_v^2}\;(X_2-x)-jk_v y].$$

530 Second equation:

$$\begin{aligned}&\mathcal{F}_{(v)}\Big[\exp[jk\sqrt{(X_2-x)^2+(v-y)^2}]\Big]\\ &\qquad= \exp[-j\sqrt{k^2-k_v^2}\;(X_2-x)-jk_v\; y].\end{aligned}$$

534 Third paragraph: ... The inversion in these imaging problems is based on the Radon's theory that a three-dimensional function can be determined from its two-dimensional ...

535 In Figure 7.9a, a typo in Receiving Element:.

536 In Figure 7.9b, a typo in Receiving Element:.

539 After equation (7.22): *... the Born and Rytov methods that was shown in Figure 7.6e. ...*

540 First paragraph: ... also called the target function's Radon transform. The Radon transform function, ...

540 Second paragraph: ... Reference [11] provides a formal proof of this concept. ...

546 Equation (7.27):

$$\begin{aligned}\Theta &= \theta+\alpha\\ U &= R\sin\alpha\end{aligned} \tag{7.27}$$

546 Last equation:

$$\begin{aligned}\Delta_\theta &\le \frac{\Delta_0}{X_0}\\ \Delta_\alpha &\le \frac{\Delta_0}{R},\end{aligned}$$