Corrections to the Text
January 30, 2008

Included below are a list of known typos in the text, *Signals and Systems*, by Alan V. Oppenheim and Alan S. Willsky. The current version of the text is the ninth printing of the second edition. Corrections made prior to the third printing are not listed here. If you find more typos or errors, please e-mail the head TA (`azunre@mit.edu`). Further corrections will be included as they become available.

- **Chapter 1**
  - On page 11, "the natural response of systems...are periodic" should be "the natural responses of systems...are periodic".
  - On page 20, Equation 1.39 is missing a t in the second exponential. It should be read $x(t) = e^{j2.5t}\left(e^{-j0.5t} + e^{j0.5t}\right)$.
  - On page 44 in the first paragraph right after 1.6.1, the first sentence should read:

    > A system is said to be *memoryless* if its output for each value of the independent variable at a given time is dependent only on the input at that same time.

  - On page 46 in the paragraph at the bottom, the first sentence should read:

    > A system is *causal* if the output at any time depends only on values of the input at the present time and in the past.

  - On page 56 in Figure 1.48, $y_0[n]$ in the caption should be replaced with $y_0(t)$.
- **Chapter 2**
  - On page 87, Figure 2.9(d) has the fourth nonzero impulse labeled on the time scale as "n". Instead the last nonzero impulse, the seventh one should be labeled "n".
  - On page 89, in eq. 2.21, $(\frac{1}{2})^k$ should be $(\frac{1}{2})^r$.
  - In Problem 2.45(a-(iii)) on page 151, Figure P2.45 should be modified so that the output of the system is $z(t) = y'(t)$ and not $y(t)$.

- In Problem 2.45(d) on page 151, Equation (P2.45-1) should be

$$y(t) = \int_{-\infty}^{\infty} x'(\tau)s(t-\tau)d\tau.$$

- **Chapter 3**
  - On page 191 in the paragraph below Equation (3.39), the word *fundamental* is misspelled.
  - On page 206 in Table 3.1, the frequency shifting property for a periodic signal should be

$$e^{jM\omega_0 t}x(t) = e^{jM(2\pi/T)t}x(t).$$

  - The limits of integration of Property 4 of Problem 3.41 should be changed so that the property is

$$\int_1^2 x(t)\ \mathrm{d}t = 2$$

- **Chapter 5**
  - In Figure 5.14 on page 378, the bottom right figure should have the title $X_{(3)}\left(e^{j\omega}\right) = X\left(e^{j3\omega}\right)$.
  - In Figure 5.17(a) on page 384, the ideal lowpass filter should have cutoff frequencies $-\omega_c$ and ω_c, not $-\omega_0$ and ω_0.
  - On page 392 in Table 5.2 the top left time domain signal should be changed to:

$$\sum_{k=<N>} a_k e^{jk(2\pi/N)n}$$

    instead of the expression in the book.
  - On page 396, Table 5.3 should be corrected in two places. For continuous time, the Fourier Transform/Frequency domain block should have the following,

$$X(j\omega) = \int_{-\infty}^{\infty} x(t)e^{-j\omega t}dt,$$

    instead of what is written for $X(j\omega)$. For discrete time, the Fourier Transform/Time domain block should have the following,

$$x[n] = \frac{1}{2\pi}\int_{2\pi} X\left(e^{j\omega}\right)e^{j\omega n}d\omega$$

    instead of what is written for $x[n]$.

- **Chapter 6**
  - On page 436, the section heading for 6.2.3 should be *6.2.3 Log-Magnitude and Phase Plots*.
  - On page 444, 4 lines from the bottom, there is an "of of" that should be "of".
  - On page 459 (examples 6.5), the last paragraph begins:

    > Similarly we can construct the asymptotic approximation for $H(j\omega)$...

    It should be read:

    > Similarly we can construct the asymptotic approximation for *the phase of* $H(j\omega)$...

  - On page 466, the the expression for B in Eqn (6.61) is missing a minus sign. The correct expression should be $B = -\frac{e^{-j\theta}}{2j\sin\theta}$.
- **Chapter 7**
  - In Figure 7.4(a) on page 519, $X_p(j\omega)$ is extraneous and should be ignored.
  - In Figure 7.21(a) on page 536, the output of the system should be $x_d[n] = x_c(nT)$. In addition, both the left and right plots of Figure 7.21(c) should have $x_d[n]$ instead of $x[n]$.
  - In Figure 7.29 on page 543, each of the phase plots should be flipped around its own horizontal axis. The current phase plots show $-\angle H_c(j\omega)$ and $-\angle H_d(e^{j\Omega})$.
  - In Figure 7.33 on page 548, in the figure second from the bottom it should have $H(e^{j\omega})$ instead of $X(j\omega)$. All the arguments of Fourier transforms should be replaced from $j\omega$ to $e^{j\omega}$. Also, (b) at the bottom of all the figures should be eliminated: Instead, the figures should be named (a), (b), (c), (d), and (e) from the top respectively.
  - In Figure 7.37 on page 553, the bottom three rows of plots are associated with part (b) of the figure.
  - In Problem 7.27, the lowpass filter depicted in Figure P7.27 is $H_1(j\omega)$ not $H(j\omega)$.

- In Problem 7.30 on page 567, Figure P7.30 has two extraneous parts. The equations $\frac{dy_c(t)}{dt} + y_c(t) = x_c(t)$ and $y[n] = y_c(nT)$ may be removed.
- In Problem 7.46 on page 576, the non-zero gain of the lowpass filter should be N. In addition, the cutoff frequency $\omega_c = \frac{\pi}{N}$.

- **Chapter 8**
  - In Figure 8.21 on pgae 600, the magnitude bars around $H(j\omega)$ are so faint that they are almost invisible.
  - In Figure 8.23 on page 602, the amplitude of the signal $c(t)$ should be labeled with the value 1.

- **Chapter 9**
  - On page 686, in the discussion on the time scaling property for Laplace Transforms, the first sentence after formula (9.90) should read,

    > That is, for any value s in R [which is illustrated in figure 9.24(a)], the value $a \cdot s$ will be in R_1, ...

    Also, in Figure 9.24 (b and c), the boundaries of the region of convergence should be $a \cdot r_2$ and $a \cdot r_1$, (rather than r_2/a and r_1/a).
  - On page 691, the bottom equation of Equation (9.5.10) in Table 9.1 should be
    $$\lim_{t\to\infty} x(t) = \lim_{s\to 0} sX(s)$$

- **Chapter 11**
  - In Problem 11.45(c) on page 889, the last line should read, "Consider both the case $0 < a < 2$ and the case $a > 2$."
  - In Problem 11.32(c), it should say, "let $p(s)$ denote the greatest common factor of $N_1(s)$ and $D_2(s)$."

- **Answers**
  - On page 933, the answer for Problem 3.1 should be: $4\cos\left(\frac{\pi}{4}t\right) - 8\cos\left(\frac{3\pi}{4}t + \frac{\pi}{2}\right)$.