Handbook of Linear Algebra
Errata List

December 11, 2007

Changes are shown in red. Minor grammatical/spelling corrections do not appear on this list unless they could cause confusion.

Corrections and clarifications involving chapter interaction:

- The definition of *sparse* varies with the chapter. Specifically, in Chapter 43 sparse means few nonzero entries, whereas in Chapter 40 it means few nonzero entries and in addition that it behaves well under gaussian elimination. See also correction below to the definition of sparse in the Glossary.

Corrections and clarifications within a single chapter (in order):

Ch. 2 p. 2-3, Application 1, last sentence should be:
In general, the solution space for a linear homogeneous differential equation is a vector space, meaning that any linear combination of solutions is again a solution.

Ch. 9 p, 9-3, Fact 3(c) is wrong. Fact 3 should be:

3. (Characterizing Aperiodicity) [HJ85, §8.5] Let P be an irreducible nonnegative $n \times n$ matrix. The following are equivalent:
   (a) P is aperiodic.
   (b) $P^m > 0$ for some m (see §5.3.6).
   (c) $P^m > 0$ for all $m \geq n^2 - 2n + 2$.
   (d) $P^{n^2-2n+2} > 0$.

Ch. 16 p. 16-7, Example 2: The second symbol $a(t)$ is wrong. The whole example should be:

2. Pseudospectra of matrices with the symbols

$$a(t) = \mathrm{i}t^4 + t^2 + 2t + 5t^{-2} + \mathrm{i}t^{-5}$$

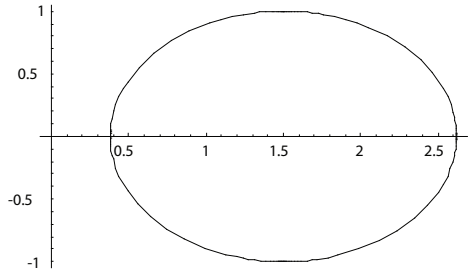
and

$$a(t) = 3\mathrm{i}t^4 + t + 3\mathrm{i}t^{-2}$$

are shown in Figure 16.5

Ch. 17 p. 17-3, Fact 9, delete the extraneous phrase at end of the first line; first line should be:
Let $A \in \mathbb{C}^{m\times n}$.

Ch. 18 p. 18-3 Figure 18.1 is wrong. It should be:



Ch. 37 p. 37-9, Fact 3, last sentence could be rephrased as:
If the matrix norm used to compute $\|A^{-1}\|$ is induced by the vector norm used to compute $\|b\|$, then equality is possible.

Ch. 40 p. 40-15, Example 1, 5,5-entry of the triangular factorization of A is wrong. The factorization should be:

$$A = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ -\frac{1}{7} & 1 & 0 & 0 & 0 \\ \frac{1}{7} & -\frac{1}{50} & 1 & 0 & 0 \\ -\frac{1}{7} & \frac{1}{50} & -\frac{1}{51} & 1 & 0 \\ \frac{1}{7} & -\frac{1}{50} & \frac{1}{51} & -\frac{1}{52} & 1 \end{bmatrix} \begin{bmatrix} 7 & 1 & -1 & 1 & -1 \\ 0 & \frac{50}{7} & -\frac{1}{7} & \frac{1}{7} & -\frac{1}{7} \\ 0 & 0 & \frac{357}{50} & -\frac{7}{50} & \frac{7}{50} \\ 0 & 0 & 0 & \frac{364}{51} & -\frac{7}{51} \\ 0 & 0 & 0 & 0 & \frac{371}{52} \end{bmatrix}$$

Ch. 71 p. 71-1: The version of MATLAB discussed in Chapter 71 is MATLAB 7.0 (also referred to as release 12). Since then they have come out with 3 or 4 new releases, but there do not seem to be any changes in the way matrix computations are done.

Ch. G p. G-34, **sparse** should be:
sparse (matrix A): Substantial savings in either operations or storage can be achieved when the zero elements of A are exploited during the application of Gaussian elimination to A, **40.2**. A large fraction of the entries of A are zeros, **43**.