List of Errata and Comments for "An Introduction to Natural Computation" by Dana Ballard*

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The book has been used as compulsory material in the Neural Networks course taught at the Department of Electrical Engineering of the University of Twente in the academic year 1999–2000. This document only lists clear errors detected in the text. For missing derivations, inconsistency in notation, etc., the reader is referred to the reprints of the transparencies (available through the course's web page).

Chapter 2

- p 37, in the text of the *Example*: replace $\frac{4}{9}$ by $\frac{2}{9}$ in the denominator of the square root in the expression for x_2.

Chapter 4

- p 79, equation below "Now, ... ": replace S_{n1}, S_{n2}, and S_{nn} by respectively S_1, S_2, and S_n.
- p 84, second line of first equation should become: $\Sigma = \frac{1}{M}AA^T$; however, leaving out the division by M does not affect the discussion that follows (all eigenvectors are just scaled).
- p 87, Equation 4.4: remove the factor "4" that shows up at the end of the equation.

Chapter 5

- p 101, sentence starting with "In other words, ... " in text under equation with matrix: leave out the words "the sum of".
- p 104, second paragraph: the case described is not illustrated in Figure 5.4c.
- p 106, halfway the page: the notation $S(x, r)$, meaning a sphere with center x and radius r, is nowhere introduced.

Chapter 6

- p 119, first line: the title of the example is wrong.
- p 122: note that $\delta\mathbf{x}(0) = 0$ because the initial state is the same for $\mathbf{u}$ and $\mathbf{v}$.
- p 123, integral after "Thus": the transposition operator T is missing in the first term. For understanding the next equation realize that $\psi[\mathbf{x}(T) + \delta\mathbf{x}(T)] \approx \psi[\mathbf{x}(T)] + \psi_x^T \cdot \delta\mathbf{x}$. Consequently, the equation should contain ψ_x^T rather than ψ_x. In the second term, again, the transposition operator is missing for H_x. Then, the bottom equations become: $-\dot{\lambda} = H_x(\lambda, \mathbf{x}, \mathbf{u})$ respectively $\lambda(T) = \psi_x[\mathbf{x}(T)]$. These corrections should also be applied to Box 6.2 on the next page. Finally, the lower case f in the box should be a capital $\mathbf{F}$.

Chapter 7

- p 146, 147: In the main discussion the elements of the vectors $\mathbf{x}$ have a value of either 1 or -1, but the encoding of Figure 7.4 shows vector elements with values 1 and 0.
- p 148, one but last paragraph: the word "sum" in the first sentence refers to the summation in the second term of Equation 7.3; $\mu = 0$ rather than $\mu = N$.
- p 153: note that $A\mathbf{x}$ does not yield the Hamming distance in the conventional sense (viz. the number of distinct bits, so a figure between 0 and N), but a measure between $-N$ and N.

Chapter 8

- p 166, Figure 8.3: the positions of the white circles in the

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bottom part are not very accurate; they should exactly correspond to the multiplication of the white circles in the top part by -1.

- p 168, line below Equation 8.2: d should be bold.
- p 169, top equation: the elements in the right-hand side vector should be $\mathbf{w}_1^{k\,T}$ rather than $\mathbf{w}_1^k$, etc.

Chapter 9

- p 185, bottom line: replace “8” by “7”.
- p 195, equation for $\frac{dE}{db}$: replace twice x by b.

Chapter 12

- p 263, third item in list: detach “of” from “derivatives”.