List of errors in first printing of Tutorial on Neural Systems Modeling

Chapter 1

page 22, second to last paragraph, near bottom
is now: implements Equation 1.7 using \( y(t) = W \cdot y(t-1) + V \cdot x(t-1) \)
should be: implements Equation 1.7 using \( y(:,t) = W \cdot y(:,t-1) + V \cdot x(:,t-1) \)

Chapter 2

page 59, last full paragraph
is now: (e.g., Barreiro et al. 2008)
should be: (e.g., Barreiro et al. 2009)

page 61, question 2.3
is now: \( w_{12} = 0.44 \)
should be: \( w_{12} = -0.44 \)

page 61, question 2.3 again
remove: We also want the input to be \( v_1 = 1 \) but \( v_2 = 0 \).

Chapter 3

page 87, MATLAB Box 3.3, first block
is now:
\[
\text{\% forward weight matrix } V \text{ and recurrent weight matrix } W \\
\text{\% must already be available in the workspace} \\
\text{should be:} \\
\text{\% forward weight matrix } V, \text{ recurrent weight matrix } W, \text{ and} \\
\text{\% input vector } x \text{ must already be available in the workspace}
\]

page 87, last partial paragraph, last line on page
is now: limit of 10 while the rest have been driven to
should be: limit of 10 while most of the rest have been driven to

page 88, last partial paragraph, before middle
is now: some units are fully active while the rest are silent.
should be: some units are active while the rest are silent.

Chapter 4

page 98, last paragraph, near end
is now: memory item can be represented as pattern of activity over a network
should be: memory item can be represented as a pattern of activity over a network
is now: In this chapter will use Hebbian learning to should be: In this chapter we will use Hebbian learning to

is now: (y'jt) (2y'j - 1) should be: (y'jt) (2y'j - 1)
(Just change the first subscript j to subscript i. See also next two items.)

is now: (2y'j - 1) (y'jt) should be: (2y'i - 1) (y'jt)

is now: (2y'j - 1) (2y'j - 1) should be: (2y'i - 1) (2y'j - 1)

is now: (l = 1, ... n where n is the number of training patterns). should be: (l = 1, ..., n where n is the number of training patterns).

is now: The result is shown in Figure 4.6B. The second training pattern should be: The result is shown in Figure 4.6B. The first training pattern

should be: P(1, [1:2:49])=1, P(2, [1:5 11:15 21:25 31:35 41:45])=1, P(3, [2:2:50])=1.

Chapter 5

is now: those like it. The algorithm should be: those like it. The algorithm

is now: The values in B and C are shown pictorially in should be: The values in B and C are shown pictorially in
page 146, first partial paragraph, near top
is now: of the three output units to each input pattern.
should be: of the three output units to a different input pattern.

page 147, Figure 5.3A, x-axis label
is now: Output unit number
should be: Input unit number
(The x-axis label for Figure 5.3A should be “Input unit number”. Note that the x-axis label for Figure 5.3B is correct as “Output unit number”.)

page 167, Exercise 5.3, near bottom
is now: midrange? Are the all the output units equally broadly tuned
should be: midrange? Are all the output units equally broadly tuned

page 168, Exercise 5.4, near bottom, above Table E5.1
is now: with neighborhood size 1 (nHood=1), are retest the trained network
should be: with neighborhood size 1 (nHood=1), and retest the trained network

Chapter 6

page 192, two lines before Equation 6.9
is now: The error signal at the hidden layer index (i) takes a rather
should be: The error signal at the hidden layer (index i) takes a rather

page 193, first partial paragraph, a few lines before first full paragraph
is now: The error for output unit \( z_1 \) is \( e_1 = d_1 - y_1 = 1 - 0.61 = 0.39 \).
should be: The error for output unit \( z_1 \) is \( e_1 = d_1 - z_1 = 1 - 0.61 = 0.39 \).

page 200, first partial paragraph, just before first full paragraph
is now: plot(Hid(2,:),Hid(3,:),'*',Out(2,:),Out(3,:),'+')
should be: plot(Hid(2,:),Hid(3,:),'*',Out(2,:),Out(3,:),'+')

page 201, line one, first line on the page
is now: issue again in Chapter 14.)
should be: issue again in Chapter 13.)

page 208, last paragraph
is now: through different mechanisms
should be: through different mechanisms

Chapter 7

page 215, third full paragraph
is now: synaptic strength fluctuates randomly on a continuous basis.
should be: synaptic strength fluctuates randomly on a continual basis.
(Just change “continuous” to “continual”.)
page 215, second full paragraph, near end
is now: neural networks that continuously explore weight space
should be: neural networks that continually explore weight space

page 215, third full paragraph, past middle
is now: synaptic strength fluctuates randomly on a continuous basis. Of critical
should be: synaptic strength fluctuates randomly on a continual basis. Of critical

page 219, last partial paragraph, first line
is now: perturbation of one weight at time
should be: perturbation of one weight at a time

page 221, first partial paragraph, near top of text
is now: through perturbation of one weight at time
should be: through perturbation of one weight at a time

page 244, in paragraph that starts on this page
is now: (the first 200 trails are pre-training)
should be: (the first 200 trials are pre-training)

page 245, Figure 7.11
The solid curve (for SUMO) should extend along the response equals zero grid line all
the way back to the training cycle equals zero line.

page 247, Exercise 7.2
is now: as when newer>=error is true
chang to: as when newErr>=error is true

page 248, Exercise 7.4
is now: command call=wch*hear)*hear with call=0 in script
should be: command call=wch*hear with call=0 in script
(Remove “) *hear”).

Chapter 8

page 253, last two lines of text on this page
is now: a single variable or a vector, and it can have any number
should be: a single variable or an ordered list (tuple), and it can have any number

page 255, first full paragraph, near bottom
is now: how many units compose the output layer or how may discrete states
should be: how many units compose the output layer or how many discrete states
page 261, MATLAB Box 8.2, preamble, first line underneath program name
is now: % this function takes
should be: % this function takes

page 272, first full paragraph, in the middle
is now: basis functions constituted a minimum-entropy, or sparse, code.
should be: basis functions constitute a minimum-entropy, or sparse, code.

page 275, caption to Figure 8.6, near bottom
is now: The information content of the network is highest for percentages of multisensory
should be: The target information contained by the outputs of the SOM-trained network (SOM, solid line with triangles) is highest for percentages of multisensory

page 275, caption to Figure 8.6, near bottom
is now: uniformly trisensory network, in which each output unit has connections
should be: uniformly trisensory network (TRI, solid line with circle), in which each output unit has connections

page 294, first full paragraph, first line
is now: in this section is to use infolby N to show how a
should be: in this section is to use infolbyN to show how a

Chapter 9

page 305, Math Box 9.1, Equation B9.1.2, denominator of first (big) fraction
is now: \((2\pi)^{n/2} |\Sigma|^{1/2}\)
should be: \((2\pi)^{n/2} |\Sigma|^{1/2}\)
(The \(\Sigma\) symbol should be bold, as later in the same equation.)

page 305, Math Box 9.1, below Equation B9.1.2, near bottom of that text block
is now: the diagonal. The bivariate Gaussian
should be: the diagonal. The term \(|\Sigma|\) is the determinate of \(\Sigma\). The bivariate Gaussian
(Insert sentence “The term \(|\Sigma|\) is the determinate of \(\Sigma\).” The \(\Sigma\) is bold in both places.)

page 308, first full paragraph, near end, second line from end
is now: will see in the next section, the classifier
should be: will see in Section 9.3, the classifier

page 317, MATLAB Box 9.3, beginning of third code block
is now: \% compute the Gaussian likelihoods distributions
should be: \% compute the Gaussian likelihood distributions

page 321, Math Box 9.3, last line of text
is now: weight \(v_2 =\)
should be: weight \(v_2 =\)
(The letter “\(v\)” should be lower case and italic.)
page 327, first full paragraph, near beginning, second sentence
is now: The diagonal line marks likelihoods for which both variables are equal
should be: The diagonal line marks the likelihood for which both variables are equal

page 334, second full paragraph, near middle
is now: a comparison of the weights between the correlated and uncorrelated cases
should be: a comparison of the trained weights in the correlated and uncorrelated cases

Chapter 10

page 341, in preamble, past middle
is now: This resemblance lead Alan Turing
should be: This resemblance led Alan Turing

page 343, near top
is now: the Turing machine (Seigelmann and Sontag 1991).
should be: the Turing machine (Siegelmann and Sontag 1991).

page 359, third paragraph, before middle
is now: Script rpbVelocityStorageLinear, listed in
should be: Script rbpVelocityStorageLinear, listed in

page 359, fourth paragraph, before middle
is now: In rpbVelocityStorageLinear these time steps
should be: In rbpVelocityStorageLinear these time steps

page 360, first line, right under the MATLAB Box
is now: time base tKD. Note that the five leading zeros
should be: time base tDK. Note that the five leading zeros

page 361, only full paragraph, first line
is now: The script rpbVelocityStorageLinear will set the absolute
should be: The script rbpVelocityStorageLinear will set the absolute

page 378, MATLAB Box 10.5, second line
is now: % script rpbShortTermMemTrain.m must be run first
should be: % script rbpShortTermMemTrain must be run first

page 381, second partial paragraph, near beginning
is now: principle means for evaluating whether this model
should be: principal means for evaluating whether this model
Chapter 11

page 389, first partial paragraph, first line on the page
is now: Ultimately, you will develop a map-like mental representation
should be: Ultimately, you will develop a mental representation

page 391, MATLAB Box 11.1, first line
is now: % gridWorldSetUp.m
should be: % gridworldSetUp.m

page 396, MATLAB Box 11.2, second line
is now: % script gridWorldSetUp must be run first
should be: % script gridworldSetUp must be run first

page 397, last partial paragraph, second line
is now: agent arrives at a state that does not border a terminal state,
should be: agent arrives at a state that does not border a terminal state,

page 401, MATLAB Box 11.3, second line
is now: % script gridWorldSetUp must be run first
should be: % script gridworldSetUp must be run first

page 404, second full paragraph
is now: (This target tracking idea is discussed in Section 1.5.)
should be: (This target tracking idea is discussed in Section 11.5.)

page 405, MATLAB Box 11.4, second line of code (in monotype)
is now: % script gridWorldSetUp must be run first
should be: % script gridworldSetUp must be run first

page 411, first full paragraph, underneath Equation 11.6, last two lines
is now: at any time \( t \) reduces to the value of weight of the input unit that is active
should be: at any time \( t \) reduces to the value of the weight of the input unit that is active

page 416, third full paragraph, near beginning, just before Equation 11.9
is now: described by Equations 7.5, 7.6, and 7.7 (see Chapter 7)
should be: described by Equations 7.6, 7.7, and 7.8 (see Chapter 7)

page 417, first full paragraph, near middle
is now: This complete (continuous) serial response ordering
should be: This complete serial response ordering

page 419, Exercise 11.1, near beginning
is now: reinforcement is available in gridWorldSetUp (see MATLAB Box 11.1).
should be: reinforcement is available in gridworldSetUp (see MATLAB Box 11.1).
Chapter 12

page 424, last paragraph, near middle
is now: target invisible (Cui and Malpeli 2003; Ma et al., in review).
should be: target invisible (Cui and Malpeli 2003; Ma et al. 2013).

page 428, caption to Figure 12.2, last sentence
is now: The arrows indicated the directions
should be: The arrows indicate the directions

page 430, only full paragraph, near middle
is now: corresponding input pattern: \( x_{\text{ex}} = \text{InPat}(:,t) \). Next the column
should be: corresponding input pattern: \( x_{\text{ex}} = \text{InPat}(t,:) \)’. Next the column
(Note that the : and the \text{t} in the parentheses are reversed, and an apostrophe ’ is added at the end after the closing paren, all in monotype font.)

page 431, MATLAB Box 12.2, near the end, first line of last indented code block
is now: \( x_{\text{ex}} = \text{InPat}(:,t) \); % set the excitatory input vector
should be: \( x_{\text{ex}} = \text{InPat}(t,:) \)’; % set the excitatory input vector
(Note that order of the : and the \text{t} in the parentheses is reversed, and an apostrophe ’ is added at the end after the closing paren, all in monotype font.)

page 441, first full paragraph, second line
is now: the algorithmic level and use the model to make probabilistic inferences,
should be: the algorithmic level and use to make probabilistic inferences,

page 454, first partial paragraph, first two lines of text
is now: observations, and actions. (See Russel and Norvig 1995 for details.)
should be: observations, and actions. (See Russel and Norvig 1995 for details.)

page 461, Figure 12.15 legend, label for dashed curve
is now: Unit
should be: Unlit
(The dashed curve label should be “Unlit” as in the legend for Figure 12.16.)

page 461, caption to Figure 12.15, at the end
is now: (After Ma et al., in review.)
should be: (After Ma et al. 2013.)

page 468, only full paragraph, at the end
is now: lit targets (Ma et al., in review).
should be: lit targets (Ma et al. 2013).

page 468, caption to Figure 12.18, at the end
is now: (After Ma et al., in review.)
should be: (After Ma et al. 2013.)
page 469, first partial paragraph, at the end, before first full paragraph
is now: see also Ma et al., in review).
should be: see also Ma et al. 2013).

page 469, in first full paragraph, near the end
is now: (Cui and Malpeli 2003; Ma et al., in review),
should be: (Cui and Malpeli 2003; Ma et al. 2013),

page 478, fourteenth reference, to Ma et al.
is now: Ma R, Cui H, Lee S-H, Anastasio TJ, Malpeli JG (in review) Predictive encoding of moving target trajectory by neurons in the midbrain.

Chapter 13

page 484, first partial paragraph, first line on this page
is now: optic tectum is the amphibian analog of the superior colliculus in mammals
should be: optic tectum is the amphibian homolog of the superior colliculus in mammals

page 484, last partial paragraph, near middle
is now: Experiments using genetic knock-out animals
should be: Experiments using genetically manipulated animals

page 486, first full paragraph, near middle
is now: competitive “gastronomic environment.” Variability of the salads
should be: competitive “gastronomic environment.” Variation of the salads

page 502, only full paragraph, first paragraph of Section 13.4, before middle
is now: (here binary) that feed-back on each other but not on themselves.
should be: (here binary) that feed back on each other but not on themselves.

page 508, first paragraph, closer to end
is now: using the command dog=g(dwtVec(chrom)*d). Note that
should be: using the command dog=g-(dwtVec(chrom)*d). Note that

page 510, first full paragraph, near end
is now: encode proteins that mediate various process that would allow the networks
should be: encode proteins that mediate various processes that would allow the networks
Chapter 14

page 518, second full paragraph, near bottom
is now: binding of a ligand, such as an ion, neurotransmitter, hormone,
should be: binding of a ligand, such as a neurotransmitter, hormone,

page 518, last partial paragraph, near bottom of page
is now: Motifs can be though of as sub-networks having
should be: Motifs can be thought of as sub-networks having

page 536, first partial paragraph, past middle
is now: InMin described here (Anastasio 2001), but all stellate weights are
should be: InMin described here (Anastasio 2001), but all perturbable weights are

page 536, first partial paragraph, near end
is now: (Rothganger and Anastasio, in review; see also Chapter 7).
should be: (Rothganger and Anastasio 2009; see also Chapter 7).

page 538, last partial paragraph, near end of text on that page
is now: derived (Rothganger and Anastasio, in review). Because weight updates
should be: derived (Rothganger and Anastasio 2009). Because weight updates

page 542, eleventh reference, to Rothganger and Anastasio
is now: Rothganger F, Anastasio TJ (in review) Using input minimization to train a
cerebellar model to simulate regulation of smooth pursuit.
should be: Rothganger F, Anastasio TJ (2009) Using input minimization to train a
cerebellar model to simulate regulation of smooth pursuit. Biological Cybernetics
101:339-359.