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with John Strawn, Curtis Abbott, John Gordon, and Philip Greenspun

The Computer Music Tutorial

Corrections and Revisions

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Preface

Page xx, first full paragraph, third line of text, should read:
". . . **Philip** Greenspun of the MIT Department of Electrical Engineering . . ."

Chapter 1

Page 18, second line of text, should read:
". . . its third harmonic is **1320** Hz, . . ."

Page 18, "Phase" section, third line of text, should read:
"If we displace the starting point **to π radians** . . ."

Page 27, "Aliasing (Foldover)" section, second paragraph, sixth line of text:
Delete "This means that one cycle takes longer than the interval between samples."
Author's note: Actually it is shorter (11 cycles in 10 samples), but the explanation is clearer without mentioning it.

Chapter 3

Page 89, first full paragraph, starting with "Max Mathews …," should read:
"Max Mathews completed Music II in 1958; it was written in assembly language for the IBM **7090** computer, **an improved computer** along the lines of the IBM 704. The **7090** ran several times faster than the **older machine**. It was thus possible to implement more ambitious synthesis algorithms.

Page 112, caption of figure 3.12, first line of text, should read:
"Numerical score example. **Two** lines of comments . . ."

Chapter 4

Page 119, first line of text, should read:
"Composers of musique concrète work directly with sound objects, **as in *De Natura Sonorum* (1975) by Parmegiani** (Schaeffer 1977; Chion 1982)."

Page 143, "Sources of Control Data" section, third paragraph, second line of text:
Delete "An example is John Chowning's *Stria* (1977), realized with additive synthesis of inharmonic spectra."

Chapter 5

Page 173, Figure 5.12 caption, first line of text, should read:
"**Detail of** Fourier grid dividing the time domain and the frequency domain . . ."

Page 175, "Quasi-synchronous" section, second paragraph, third line of text, should read:
". . . because the grains follow **at a slightly varying time interval**."

Page 184, "Assessment" section, first line of text, should read:
"Granular synthesis constitutes **a body of microsonic** techniques that **share the concept** of sonic grains."

Page 197, second full paragraph, second line of text, should read:
". . . composers such as Jean-Claude Risset in his composition ***Voilements*** **(1987)**. Running software written . . ."

Chapter 6

Page 261, "Conclusion" section, fifth line of text, should read:
". . . many sidebands, and partly due to the flexibility of the FM **parameters**."

Chapter 7

Page 270, first full paragraph, starting with "Impedence effects . . .":
Replace all "impedence" with "impedance." There are six instances.

Page 282, fourth paragraph, first line of text, should read:
"The next four sections describe a waveguide model of **struck** strings, . . ."

Page 282, "Waveguide Model of Plucked Strings" section title, should read:
"Waveguide Model of **Struck** Strings"

Page 293, first paragraph, sixth line of text, should read:
". . . basic KS synthesis are modest.
Author's note: Delete parenthetical remark because this technique is not explained, and the text uses multiplications.

Chapter 8

Page 333, second line of text, should read:
"Marino, Serra, and Raczinski **1993**; . . ."

Page 343, caption of figure 8.15, should read:
"The time and amplitude barriers **(P, N, T)** defining a mirror constrain the next vertex generated from the vertex marked by an asterisk. If the next vertex generated stochastically **(the initial projection I)** falls outside the barriers indicated by **the box, the barrier P overrides** this choice, reflecting the vertex back into the box (reflection R)."

Chapter 10

Page 424, "Relationship of Convolution" section, beginning with first line of text, should read:
"Convolution is directly related to filtering. Recall the equation of a general FIR filter:

$$y[n] = (a \times x[n]) \pm (b \times x[n-1]) \pm \ldots (\boldsymbol{j} \times x[n-\boldsymbol{k}])$$

We can think of the coefficients a, b, ... $\boldsymbol{j}$ as elements in an array $h(\boldsymbol{j})$, where each element in $h(\boldsymbol{j})$ is multiplied times the corresponding element in array $x[\boldsymbol{k}]$."
Author's note: Change i to j, and change j to k.

Chapter 11

Page 463, last line of text on the page, should read:
". . . namely *Doppler shift*, first described by the **physicist** C. Doppler (1842)."

Page 475, figure 11.17:
The horizontal axis is Time, not Frequency.

Page 487, third line of text, should read:
"It **has been speculated** that clouds in the atmosphere contribute a reverberation effect."

Chapter 13

Page 575, fouth line of text, should read:
"This can be demonstrated by subtracting the **TPV spectrum** from the original **spectrum** to yield a *residual signal* (Strawn 1987a; Gish 1978, 1992; Serra 1989)."

Chapter 14

Page 649, caption of figure 14.11, second line of text, last word:
Should be "vary" instead of "varying."

Chapter 17

Page 809, first line of text, should read:
"There are minor syntactic differences between Music 1000 and the Music **0** language previously described. Whereas Music **0** gives the signal to the left of the ← sign, . . ."

Chapter 20

Page 921, top of page, figure caption 20.4 should be:
Figure 20.4 Yamaha DX7II FD synthesizer.

Page 936, eighth line of text, should read:
". . . for a sample within 1/50,000th of a second, or 20 **microseconds**, . . ."

Chapter 21 MIDI

Page 1007, "Bandwidth limitations" section, second line of text, should read:
"It takes 320 **µsec** to transmit one word, or 960 **µsec**. . ."

Page 1016:
Delete "MIDI Contacts" section.

Appendix

Page 1075, "Fourier Analysis" section, second line of text, should read:
". . . Fourier (1768–1830), **presented a revised** theory . . ."

Page 1100, caption of figure A.17, last line of text, should read:
". . . window indicates sidebands ranging from 22 To **4004 Hz**."

References

Page 1135, "David, E., M. Mathews, and H. McDonald. 1958. 'Description and results of experiments with speech using digital computer simulation.' *Proceedings of* ***the National Electronics Conference*****. Volume IV. Chicago: National Electronics Conference.** pp. 766–775."

Page 1146:
Move "Bird, J. 1982. *Percy Grainger*." to page 1122.

Page 1161, "Levitt, D., 1981" entry, should read:
"A melody description system for jazz improvisation." M.S. Thesis. Cambridge, Massachusetts: **M.I.T.** Artificial Intelligence Laboratory.

Page 1164, "Marino, G., M.-H. Serra, and J.-M. Raczinski. 1993" entry, should read:
"Marino, G., M.-H. Serra, and J.-M. Raczinski. **1993**. 'The UPIC system, origins and innovations.' *Perspectives of New Music* **31(1): 258–269**."

Page 1165, "Mathews, M., J. Miller, and E. David, Jr. 1961. 'Pitch synchronous analysis of voiced sounds.' *Journal of the* ***Acoustical*** *Society of America* 33: 179–186.

Page 1166, "McAdams, S. **1982**. 'Spectral fusion and the creation of auditory images.' In M. Clynes, ed. *Music, Mind, and Brain: The Neuropsychology of Music*. New York: Plenum.

Name Index

Page 1206, add:
"Englert, G., 685"

Page 1208, add:
"Parmegiani, B., 119"

Page 1209, "Strawn, J." entry, add:
"131, 150"