

# References

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- Abramowitz M and Stegun IA. (1975). *Handbook of Mathematical Functions*. Academic Press, New York.  
*A table of mathematical functions including a part on Laplace transforms. This book can be downloaded from several websites.*
- Boas ML. (1966). *Mathematical Methods in the Physical Sciences*, 2nd ed. John Wiley & Sons, New York.  
*A textbook on basic mathematical techniques.*
- Brigham EO. (1974). *The Fast Fourier Transform*. Prentice-Hall, Englewood Cliffs, NJ.  
*An introduction to fast Fourier transform and related topics using graphical representations as a didactic tool.*
- Chirlian PM. (1994). *Signals and Filters*. Van Nostrand Reinhold, New York.
- Cooley JW and Tukey JW. (1965). An algorithm for machine calculation of complex Fourier series. *Math Computation* 19:297–301.
- Cox DR. (1962). *Renewal Theory*, Methuen, London.  
*A classic introduction to the statistics of renewal theory. This approach has a high relevance for statistics of spike trains.*
- Dorman MF and Wilson BS. (2004). The design and function of cochlear implants. *American Scientist* 92:436–445.
- Duchamp-Viret P, Duchamp A, and Vigouroux M. (1989). Amplifying role of convergence in olfactory system a comparative study of receptor cell and second-order neuron sensitivities. *J Neurophysiol* 61:1085–1094.
- Feigenbaum MJ. (1983). Universal behavior in nonlinear systems. *Physica D* 7: 16–39.
- Gotman J and Gloor P. (1976). Automatic recognition and quantification of interictal epileptic activity in the human scalp EEG. *Electroencephalogr Clin Neurophysiol* 41:513–529.  
*The first paper describing a successful automated time domain analysis to detect epileptic spike activity in clinical recordings. Although relatively simple, this method is still being used in clinical equipment today.*
- Hamilton JD. (1994). *Time Series Analysis*. Princeton University Press, Princeton, NJ.  
*An excellent book providing an extensive overview of analysis of time series and its underlying models. A disadvantage for neuroscientists is that the examples are from economy and finance.*

- Hjorth B. (1970). EEG analysis based on time domain properties. *Electroencephalogr Clin Neurophysiol* 29:306–310.  
*Introduction of activity, mobility, and complexity parameters in EEG analysis.*
- Hodgkin AL and Huxley AF. (1952). A quantitative description of membrane current and its application to conduction and excitation in the nerve. *J Physiol* 117:500–544.  
*A seminal paper describing the Hodgkin and Huxley equations.*
- Hsu HP. (1995). *Signals and Systems*. Schaum's Outline Series. McGraw-Hill, New York.  
*A compilation of examples and exercises relevant for signal analysis.*
- Iasemidis LD, Sackellares JC, Zaveri HP, and Williams WJ. (1990). Phase space topography and the Lyapunov exponent of electrocorticograms in partial seizures. *Brain Topogr* 2:187–201.
- Ingle VK and Proakis JG. (1997). *Digital Signal Processing Using MATLAB V. 4*. PWS Publishing Company, Boston.
- Jordan DW and Smith P. (1997). *Mathematical Techniques*. Oxford University Press, Oxford.  
*An overview of calculus, meeting requirements in engineering or physics. The book covers differentiation, integration, matrix/vector algebra, differential equations, transforms, discrete mathematics, and statistics.*
- Kaplan D and Glass L. (1995). *Understanding Nonlinear Dynamics*. Springer-Verlag, New York.  
*An excellent introduction into the application of nonlinear dynamics to analysis of time series. The work includes multiple examples and computer projects.*
- Lorenz EN. (1963). Deterministic non-periodic flow. *J Atmos Sci* 20:130–141.
- Mallat S. (1998). *A Wavelet Tour of Signal Processing*. Academic Press, San Diego, CA.
- Marven C and Ewers G. (1996). *A Simple Approach to Digital Signal Processing*. John Wiley & Sons, New York, NY.  
*A simple introduction to data acquisition, filters, fast Fourier transform, and digital signal processing. This introduction requires minimal skills in mathematics.*
- Northrop RB. (2003). *Signals and Systems Analysis in Biomedical Engineering*. CRC Press, Boca Raton, FL.  
*An excellent introduction to signal processing and linear systems including a review of basic techniques for solving ordinary differential equations, matrix algebra, and transformations. Some examples of nonlinear systems analysis are included.*
- Oostenveld R and Praamstra P. (2001). The five percent electrode system for high-resolution EEG and ERP measurements. *Clin Neurophysiol* 112:713–719.  
*Definition of the electrode placement in human EEG recording.*
- Peitgen H-O, Jürgens H, and Saupe D. (1992). *Chaos and Fractals New Frontiers of Science*. Springer-Verlag, New York.

- An introduction into the field of nonlinear dynamics with a wealth of examples. Clear explanation of concepts such as self-similarity, dimensionality, entropy, and Lyapunov exponents are provided. Throughout the text, a minimal background in mathematics is required.*
- Press WH, Teukolsky SA, Vetterling WT, and Flannery BP. (1992). *Numerical Recipes in C*, 2nd ed. Cambridge University Press, Cambridge, MA.
- Recio-Spinoso A, Temchin AN, van Dijk P, Fan Y-H, and Rugero MA. (2005). Wiener-Kernel analysis of responses to noise of chinchilla auditory-nerve fibers. *J Neurophysiol* 93:3615–3634.
- Rieke F, Warland D, de Ruyter van Steveninck R, and Bialek W. (1999). *Spikes Exploring the Neural Code*. MIT Press, Cambridge, MA.  
*A unique book introducing spike train analysis from a probabilistic point of view.*
- Schouten JC, Takens F, and van den Bleek CM. (1994). Maximum-likelihood estimation of the entropy of an attractor. *Phys Rev E* 49:126–129.
- Shannon CE and Weaver W. (1949). *The Mathematical Theory of Communication*. University of Illinois Press, Urbana, IL.
- Shaw JC. (1981). An introduction to the coherence function and its use in EEG signal analysis. *J Med Engineering & Technology* 5:279–288.
- Spiegel J, Hansen C, Baumgärtner U, Hopf HC, and Treede R-D. (2003). Sensitivity of laser-evoked potentials versus somatosensory evoked potentials in patients with multiple sclerosis. *Clin Neurophysiol* 114:992–1002.  
*An example of the application of evoked potentials in clinical electrophysiology.*
- Strogatz SH. (1994). *Nonlinear Dynamics and Chaos*. Perseus Books, Cambridge, MA.
- Takens F. (1981). Detecting strange attractors in turbulence. In *Lecture Notes in Mathematics, Dynamical Systems and Turbulence*, Vol. 898. (Eds. Rand DA and Young LS), Springer-Verlag, Berlin: pp. 366–381.
- Towle VL, Carder RK, Khorashani L, and Lindberg D. (1999). Electrocorticographic coherence patterns. *J Clin Neurophysiol* 16:528–547.  
*An example of the application of coherence in clinical electrophysiology.*
- Van Drongelen W, Holley A, and Døving KB. (1978). Convergence in the olfactory system: Quantitative aspects of odour sensitivity. *J Theor Biol* 71:39–48.  
*A modeling study in which neurons are represented as spike generators following a Poisson process. Based on this representation, the amplification effect of convergence of neural elements is estimated.*
- Van Drongelen W, Koch H, Marcuccilli C, Peña F, and Ramirez JM. (2003). Synchrony levels during evoked seizure-like bursts in mouse neocortical slices. *J Neurophysiol* 90:1571–1580.  
*Analysis of single and multi-unit recordings of neural activity. A basic application of the estimation of information content and entropy in spike trains.*

van Drongelen W, Lee HC, and Hecox KE. (2005). Seizure prediction in epilepsy. In *Neural Engineering* (Ed. He B), Kluwer Academic/Plenum, New York: pp. 389–420.

*An introduction into the application of nonlinear dynamics for the prediction of seizure activity in EEG signals.*

Walker JS. (1999). *A Primer on Wavelets and Their Scientific Applications*. Chapman & Hall/CRC, Boca Raton, FL.

*An excellent introduction to wavelet analysis including a lot of numerical and practical examples.*

Wolf A, Swift JB, Swinney HL, and Vastano JA. (1985). Determining Lyapunov exponents from a time series. *Physica D* 16:285–317.