NEURAL SOURCE

THE BIBLIOGRAPHIC GUIDE TO ARTIFICIAL NEURAL NETWORKS

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The Bibliographic Guide to Artificial Neural Networks

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FOREWORD

This volume by Philip Wasserman is a labor of love. It responds to a widely felt need for information that is in many ways unique in the history of science.

Due to a combination of historical accidents, and a multifaceted subject matter that intersects an unusually large number of disciplines, the neural network literature is sprawling. Individuals who are new to the field often find it difficult to get a sense of its scope. In the past, they have all too often gotten excited by an accidental exposure to a fragment of its literature and then been at a loss about where to go from there. Because neural network contributions may be found in journals and books of mathematics, computer science, psychology, biology, physics, and engineering, no obvious path to the greater literature might present itself to an aspiring teacher or researcher.

Many steps are now being taken in parallel to make learning and research in the neural network field more systematic and enjoyable for all. Some of these steps, such as the creation of the International Neural Network Society and its journal *Neural Networks*, have been undertaken to facilitate the type of interdisciplinary communication, research, and education that make it easier for new students and established researchers in the field to share knowledge as it is being created. Others, such as the contents of this book, provide a resource for efficiently sampling the key contributions to the field on which contemporary research and education are founded.

By facilitating access to the foundations of our field, both classical and up-to-date, Philip Wasserman has made it easier for all interested individuals to know the true history of our subject, thereby to better understand its scientific power and richness and to participate more effectively in its vibrant future.

Stephen Grossberg

PREFACE

The recent growth in artificial neural network research has created a flood of technical papers; for example, more than 1000 appeared in 1989 alone. In addition, during the past century, several thousand important works have been published in a wide variety of technical journals, books, and research reports. This body of literature represents a valuable foundation upon which to build current research. Indeed, it is important that the researcher has access to this historical information if wasteful repetition is to be avoided.

NeuralSource is designed to provide ready access to this literature. With more than 4200 entries in the Reference section and over 3000 abstracts, it includes the bulk of the published information on artificial neural networks. Furthermore, it includes three comprehensive indexes to identify articles by author, publication, or keyword, thereby allowing access according to the user's current interests.

NeuralSource is an outgrowth of NeuralBase, a computerized database of artificial neural network publications. This book has been computer generated from the database, a method which ensures accuracy and consistency among the indexes and references. Intended for situations where a computerized format is inappropriate, NeuralSource is an economical alternative which retains the completeness of the original. Purchasers of NeuralSource who need the speed and convenience of the computer database version can purchase NeuralBase at a substantial discount by using the order form at the rear of this volume.

NeuralSource is a work in progress. Periodic updates are planned which will incorporate new work as it is published, as well as newly discovered articles from the past. In this way NeuralSource will grow with the field, continuing to provide a comprehensive, easily used means to access this body of knowledge. Qualified authors are invited to submit appropriate papers for review. Please enclose a three line abstract and send them to:

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NeuralSource will benefit both the experienced researcher and the student. When used in conjunction with a technical library, it will accelerate research programs, avoid duplication of effort, and stimulate creativity through improved communication.

INTRODUCTION

NeuralSource is largely self-explanatory; you can start using it immediately without instruction. However, a few minutes spent reviewing the following is recommended. You will find that knowing something of the internal structure of the book will save you time, energy, and frustration.

NeuralSource is composed of four sections; a Reference section plus three indexes on Author, Keyword, and Publication. The Reference section contains the full bibliographic entry including an abstract for most listings. Each index contains an abbreviated listing with a keynumber printed in bold numerals. This keynumber will be found in the left margin of the Reference section beside the associated entry.

The Reference section contains listings in chronological order, earliest listing first. Thus, it constitutes, in effect, a fourth index allowing articles to be located by their year of publication. Listings for a given year are arranged in alphabetical order by first author, a great help for those years with a large number of publications. In many cases the Reference section can be used directly without referring to an index. If an author's name and approximate publication date is known, access is most easily done in this way.

The Author index listings are in alphabetical order by author's last name. All of the works of a given author are together, even if given as the second or third author on the publication. Note that this produces some redundancy; an article with three authors will be listed in three places. Only the first three authors are included for each listing. The works of each author are listed in order of year of publication, earliest publication first.

The Publication index includes listings for all published articles and books, listing alphabetically by journal name or book title. Within the listings for a given journal, entries are in chronological order by year, earliest year first. Unpublished manuscripts included in the Reference section are not listed here.

The Keyword index lists references by one of 157 keywords. An alphabetical list of keywords and suggested alternatives is included at the beginning of this index. To use the index, either go directly to the keyword in the index or first locate the appropriate keyword on the list, then find the entry in the keyword index. Using the keynumber from the listing, refer to the Reference section for the full listing. Keyword listings are highly redundant; each listing can have many keywords and may appear in several places within the index.

As with most reference words, NeuralSource will provide increasing benefits as you use it and become more familiar with its structure. With practice, it will become a helpful assistant to aid you in your research or study.

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Reference Section

0001 Brewser, D. 1847.
On the Conversion of Relief by Inverted Vision.
Edinburgh Philosophy Transactions.
15:657.

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Association.
Psychology (Briefer Course).
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Holt
Outlines some very fundamental rules of association: a correlational learning rule, synaptic summation, and inhibitory processes. This is a chapter in an introductory psychology book.

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A Study in Apperception.
American J. Psychology.
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Presents the results of a series of experiments on perception of words and letters in words as a result of various objective and subjective characteristics of the letters and words.

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Adaptation, After-Effect, and Contrast in the Perception of Curved Lines.
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Describes studies of adaptation and aftereffect in the visual field. The aftereffect studied was curvature due to prism glasses. The aftereffect was closely limited to the specific area of the visual field where the stimulus was.

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Outline of a Physico-Mathematical Theory of Excitation and Inhibition.
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The Passive Iron Wire Model of Protoplasmic and Nervous Transmission and Its Physiological Analogues.
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A Logical Calculus of Ideas Immanent in Nervous Activity.
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A Heterarchy of Values Determined by the Topology of Nervous Nets.
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Probability, Frequency, and Reasonable Expectations.
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networks. Neural nets are characterized by parameters which give the probability distributions of different kinds of synaptic connections throughout the net.

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The Components of Membrane Conductance in the Giant Axon of Loligo.
J. Physiology (London).
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Describes the results of experiments on flow of electrical current in the squid axon. Describes depolarization, and the flow of sodium ions and potassium ions.

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A Quantitative Description of Membrane Current and Its Application to Conduction and Excitation in Nerve.
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Mechanization of Thought Processes.
1 (Nov): 473-503.
Her Majesty's Stationery Office

0115 Ashby, W. R. 1959.
The Mechanism of Habituation.
Mechanization of Thought Processes.
1 (Nov): 95-118.
Her Majesty's Stationery Office

0116 Bledsoe, W. W. and I. Browning. 1959.
Pattern Recognition and Reading by Machine.
IRE Eastern Joint Computer Conference.
225-232.

0117 Bullock, T. H. 1959.
Neuron Doctrine and Electrophysiology.
Science.
129:997-1002.

Describes the history of development of the doctrine of the individual neuron, and surveys the state of research of the moment.

0118 Caldwell, S. H. 1959.
Switching Circuits and Logical Design.
New York, NY: John Wiley and Sons.

0119 Chiu, H. Y. 1959.
An Investigation of the Possibility of Using Electrolytic Cells as A-Units in the Construction of a Perceptron.
Ithaca, NY: Cornell University. Laboratory for Nuclear Studies.

0120 DeLong, D. F. 1959.
Analysis of an Adaptive Sampled-Data System. Master's Thesis.
Cambridge, MA: MIT. Dept. Electrical Engineering.

0121 FitzHugh, R. and H. A. Antosiewicz. 1959.
Automatic Computation of Nerve Excitation—Detailed Corrections and Additions.
J. SIAM.
7:447.

0122 Fry, D. B. and P. Denes. 1959.
An Analogue of the Speech Recognition Process.
Mechanization of Thought Processes.
1 (Nov): 377-384.
Her Majesty's Stationery Office

0123 Greene, P. H. 1959.
An Approach to Computers that Perceive, Learn, and Reason.
IRE Western Joint Computer Conference.
(Mar).

0124 Harmon, L. D. 1959.
Artificial Neuron.
Science.
129:962-963.

Describes an electronic model for simulating many of the gross operational functions observed in the living nerve cell. Synaptic modification is not included. Several approaches are discussed.

0125 Kullback, S. 1959.
Information Theory and Statistics.
New York: Wiley.

0126 Ladefoged, P. 1959.
The Perception of Speech.
Mechanization of Thought Processes.
1 (Nov): 399-417.
Her Majesty's Stationery Office

0127 Lettvin, J. Y., H. R. Maturana, and W. S. McCulloch. 1959.

What the Frog's Eye Tells the Frog's Brain.
IRE Proceedings.
47:1940-1951.

There are 4 distinct parallel distributed channels by which the frog's eye informs the brain about the visual image, expressed as local pattern independent of average illumination.

0128 Mackay, D. M. 1959.
Operational Aspects of Intellect.
Mechanization of Thought Processes.
1 (Nov): 37-66.
Her Majesty's Stationery Office

0129 Mattson, R. L. 1959.
The Design and Analysis of an Adaptive System for Statistical Classification. Master's thesis.
Cambridge, MA: MIT.

0130 Mattson, R. L. 1959.
A Self-Organizing Logical System.
IRE Eastern Joint Computer Conference.

0131 Mattson, R. L. 1959.
A Self Organizing Binary System.
IRE Eastern Joint Computer Conference.
212-218.

0132 McCarthy, J. 1959.
Programs with Common Sense.
Mechanization of Thought Processes.
1 (Nov): 77-91.
Her Majesty's Stationery Office

0133 Minsky, M. L. 1959.
Some Methods of Artificial Intelligence and Heuristic Programming.
Mechanization of Thought Processes.
1 (Nov): 3-28.
Her Majesty's Stationery Office

0134 Murray, A. E. 1959.
A Review of the Perceptron Program.
National Electronics Conference.
15:346-356.

0135 Rosenblatt, F. 1959.
Two Theorems of Statistical Separability in the Perceptron.
Mechanization of Thought Processes.
1 (Nov): 421-472.
Her Majesty's Stationery Office

0136 Selfridge, O. G. 1959.
Pandemonium: A Paradigm for Learning.
Mechanization of Thought Processes.
1 (Nov): 513-531.
Her Majesty's Stationery Office

Describes a parallel system of quasi-independent modules that combine to learn a classification problem, in this case, Morse code translation. The system is called Pandemonium. Considers this a model of biological functioning.

0137 Sherman, H. 1959.
A Quasi-Topological Method for Recognition of Line Patterns.
UNESCO Intl. Conference on Information Processing.
UNESCO

0138 Stark, L. and F. Baker. 1959.
Stability and Oscillations in a Neurological Servomechanism.
J. Neurophysiology.
22:156-164.

Describes analytic and experimental work on the pupil reflex to light. The reflex is analyzed as a servomechanism. The pupil servoloop is stable because of low gain. When gain is increased experimentally, instability is seen.

0139 Tou, J. T. 1959.
Digital and Sampled-Data Control System.
New York: McGraw-Hill.

0140 Uttley, A. M. 1959.
Conditional Probability Computing in a Nervous System.
Mechanization of Thought Processes.
1 (Nov): 119-152.
Her Majesty's Stationery Office

0141 Uttley, A. M. 1959.
Design of a Conditional Probability Computer.
Information and Control.
2:1-24.

Describes a special purpose computer which calculates conditional probabilities. This computer uses the illogical principle of induction and can imitate many forms of animal learning.

0142 Widrow, B. 1959.
Adaptive Sampled Data Systems—A Statistical Theory of Adaptation.
IRE WESCON Convention Record, Part 4.
3:74-85.

Describes adaptive sampled-data "Wiener-Lee systems." An example is a predictor whose purpose is to adapt in order to predict with minimum mean-square-error the next sample of a correlated random input sequence.

0143 Angyan, A. J. 1960.
Model for Neurophysiological Functions.
Symposium on Information Theory.

0144 Babcock, Inselberg, Lofgren. 1960.
Some Principles of Preorganization in Self-Organizing Systems. Technical Report #2.
Urabana, IL: University of Illinois, Urbana.

0145 Babcock, M. L. 1960.
Reorganization by Adaptive Automation. Technical Report, #1, Nonr 1834(21).
Urbana, IL: University of Illinois.

0146 Block, H. D., B. W. Knight, and F. Rosenblatt. 1960.

Analysis of a Four-Layer Series Coupled Perceptron. Paper #1.
Ithaca, NY: Cornell University. Cognitive Systems Research Program.

0147 Crane, H. D. 1960.
Neuristor Studies. Technical Report #1506-2 (AD 240 206).
Stanford, CA: Stanford University. Stanford Electronics Laboratory,.

0148 Flores, I. and L. Grey. 1960.
Optimization of Reference Signals for Character Recognition Systems.
IRE Trans. Electronic Computers.
EC-9 (1):54-61.

Discusses the role of signal structure in a signal discrimination system. A theoretical optimum class of signals is derived against which any set of signals developed within given constraints can be rated.

0149 Freeman, W. J. 1960.
Repetitive Electrical Stimulation of Prepyriform Cortex in Cat.
J. Neurophysiology.
23:383-396.

Describes impulse responses to electrical stimulation which conform to damped cosines. Periodic stimulation at different frequencies gives tuning curves. The amplitude, frequency and decay rate or "Q" vary with behavior.

0150 Hawkins, J. K. 1960.
A Magnetic Integrator for the Perceptron Program.
IRE National Convention Record, Part 2.
8:88-95.

Describes a magnetic component possessing storage and signal output properties suitable for implementation of the W-unit memory element for perceptron-type systems. Properties of the device and test results are discussed.

0151 Hay, J. C., B. E. Lynch, and D. R. Smith. 1960.
Mark I Perceptron Operators' Manual. Report # VG-1196-G-5.
Buffalo, NY: Cornell University. Aeronautical Laboratory.

0152 Hay, J. C., F. C. Martin, and C. W. Wightman. 1960.
The Mark I Perceptron, Design and Performance.
IRE National Convention Record, Part 2.
8:78-87.

Describes the design and construction of the Mark I perceptron. Describes the research on the system, including learning capacity, training methods, stability of performance with interference, and generalization to new problems.

0153 Hay, J. C. and C. W. Wightman. 1960.
The Mark I Perceptron.
Research Trends.
8 (1):1-4.

0154 Isaacs, S. S. 1960.
The Perceptron Simulation Project AML Report #126.
David Taylor Model Basin.

0155 John, E. R. 1960.
Some Speculations of the Psychophysiology of Mind.
In *Toward a Definition of Mind,*
ed. J. Scher,
Free Press.

0156 Joseph, R. D. 1960.
On Predicting Perceptron Performance.
IRE National Convention Record, Part 2.
8:71-77.

Presents mathematical analyses of the three main types of elementaryperceptrons. Gives the capabilities of the systems to classify certain environments.

0157 Joseph, R. D. 1960.
Contributions to Perceptron Theory. Report # VG-1196-G-7.
Buffalo, NY: Cornell University. Aeronautical Laboratory.

0158 Joseph, R. D. 1960.
Two Theorems on Error Correction. Project PARA Technical Memorandum #17.
Buffalo, NY: Cornell University. Aeronautical Laboratory.

0159 Kelly, P. M. 1960.
Problems in Bio-Computer Design. Bionics Symposium Record TR #68-600.
W-P AFB, OH: AFB. Wright Air Development Division, Wright-Patterson AFB.

0160 Klass, P. J. 1960.
Perceptron Shows Its Ability to Learn.
Aviation Week.
73:72-80.

0161 Marrill, T. and D. M. Green. 1960.
Statistical Recognition Functions and the Design of Pattern Recognizers.
IRE Trans. Electronic Computers.
EC-9 (4) (Dec): 472-477.

Optimization of the recognition function in pattern recognizers is discussed, and the form of the optimal function is derived. A small numerical example using hand-printed characters is reported.

0162 Mattson, R. L. 1960.
An Approach to Pattern Recognition Using Linear Threshold Devices. Report #LMSD-70268.
Lockheed Missiles and Space Co..

0163 Mowrer, D. H. 1960.
Learning Theory and Behavior.
New York, NY: Wiley and Sons.

0164 Murray, A. 1960.
Phase I Interim Report: Perceptron Applicability to Photointerpretation Technical Report # VE-1446-

G-1.
Buffalo, NY: Cornell University. Aeronautical Laboratory.

0165 Newell, A., J. C. Shaw, and H. A. Simon. 1960.
A Variety of Intelligent Learning in a General Problem Solver.
In *Self-Organizing Systems*,
ed. Yovits, Cameron, 153. New York, NY:
Pergamon Press.

Describes a learning program that acts on another program, a general problem solver, in such a way as to teach the problem solver to produce better programs.

0166 Papert, S. 1960.
Some Mathematical Models of Learning.
London Symposium on Information Theory (4th).

0167 Pierce, W. H. 1960.
A Proposed System of Redundancy to Improve the Reliability of Digital Computers. Technical Report #1552-1.
Stanford, CA: Stanford University. Stanford Electronic Labs.

0168 Platt, J. R. 1960.
How We See Straight Lines.
Scientific American.
202 (6) (Jun): 121-129.

Presents a new hypothesis on how the human eye can detect whether a line is straight. The hypothesis attributes this ability to rapid scanning motions.

0169 Rall, W. 1960.
Membrane Potential Transients and Membrane Time Constraint of Motoneurons.
Experimental Neurology.
2:503-532.

0170 Roberts, L. G. 1960.
Pattern Recognition with an Adaptive Network.
IRE National Convention Record, Part 2.
8:66-70.

Presents the results of experiments on pattern recognition with adaptive networks. The nets learned to recognize hand-written characters. A new symmetric reward function was developed.

0171 Rosenblatt, F. 1960.
Perceptual Generalization Over Transformation Groups.
Self-Organizing Systems.
63-96.
Pergamon Press

Discusses a method for dealing with the problem of classifying different transformations of the same perceptual object. The method, from perceptron studies, enables a self-organizing system to abstract common transformations.

0172 Rosenblatt, F. 1960.
On the Convergence of Reinforcement Procedures in Simple Perceptrons. Report #VG-1196-G-4.
Buffalo, NY: Cornell University. Aeronautical Labs.

0173 Ross Asby, W. 1960.
Design for a Brain (2nd ed. rev.).
New York: John Wiley and Sons.

0174 Roy, A. E. 1960.
On a Method of Storing Information.
Bulletin of Mathematical Biophysics.
22:139-168.

Describes a model for information storage that postulates traces based on threshold changes. The cells have statistically determined properties, and the stream of information is itself the encoding and decoding device.

0175 Selfridge, O. G. and U. Neisser. 1960.
Pattern Recognition by Machine.
Scientific American.
203:60-68.

Describes some early attempts at teaching machines to recognize and classify incoming data that is variable—such as hand-keyed Morse code.

0176 Widrow, B. 1960.
An Adaptive "ADALINE" Neuron Using Chemical "Memistors". Technical Report #1553-2.
Stanford, CA: Stanford University. Stanford Electronics Laboratory.

The "memistor" circuit element and its use in adaptive circuits is described. Memistor circuits for the "ADALINE" neuron and the adaptation procedure are developed.

0177 Widrow, B. 1960.
Adaptive Sampled-Data Systems.
IFAC 1st Intl. Congress.
423-429.
Intl. Federation of Automatic Control

Presents closed loop adaptive sampled-data systems and discusses automatic system synthesis by use of performance feedback.

0178 Widrow, B. 1960.
Statistical Analysis of Amplitude-Quantized Sampled-Data Systems. Technical Report #2103-1.
Stanford, CA: Stanford University. Stanford Electronics Laboratory.

Quantization and its effects in producing noise in quantized feedback systems is analyzed; the addition of an external "dither" is shown to improve system performance in some cases.

0179 Widrow, B. and M. E. Hoff. 1960.
Adaptive Switching Circuits.
IRE WESCON Convention Record, Part 4.
96-104.

Describes the ADALINE network based on a threshold logic unit with variable connection weights. Learning is supervised, with gradient descent error correction.

0180 Winder, R. O. 1960.
Single Stage Threshold Logic.