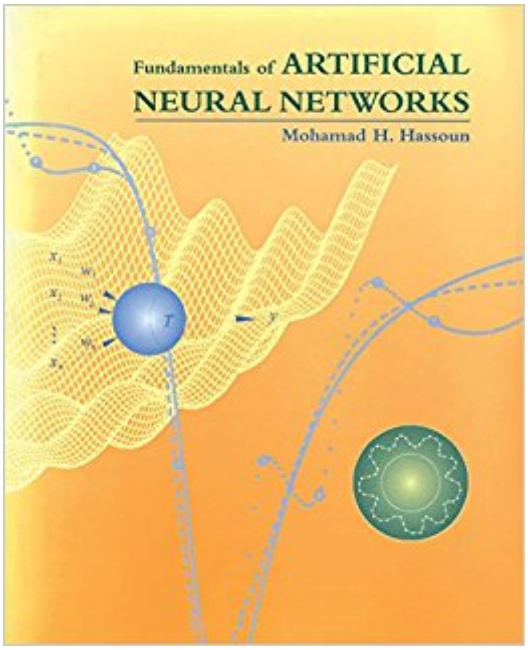
Fundamentals Of Artificial Neural Networks (MIT Press)



Synopsis

As book review editor of the IEEE Transactions on Neural Networks, Mohamad Hassoun has had the opportunity to assess the multitude of books on artificial neural networks that have appeared in recent years. Now, in Fundamentals of Artificial Neural Networks, he provides the first systematic account of artificial neural network paradigms by identifying clearly the fundamental concepts and major methodologies underlying most of the current theory and practice employed by neural network researchers.Such a systematic and unified treatment, although sadly lacking in most recent texts on neural networks, makes the subject more accessible to students and practitioners. Here, important results are integrated in order to more fully explain a wide range of existing empirical observations and commonly used heuristics. There are numerous illustrative examples, over 200 end-of-chapter analytical and computer-based problems that will aid in the development of neural network analysis and design skills, and a bibliography of nearly 700 references.Proceeding in a clear and logical fashion, the first two chapters present the basic building blocks and concepts of artificial neural networks and analyze the computational capabilities of the basic network architectures involved. Supervised, reinforcement, and unsupervised learning rules in simple nets are brought together in a common framework in chapter three. The convergence and solution properties of these learning rules are then treated mathematically in chapter four, using the "average learning equation" analysis approach. This organization of material makes it natural to switch into learning multilayer nets using backprop and its variants, described in chapter five. Chapter six covers most of the major neural network paradigms, while associative memories and energy minimizing nets are given detailed coverage in the next chapter. The final chapter takes up Boltzmann machines and Boltzmann learning along with other global search/optimization algorithms such as stochastic gradient search, simulated annealing, and genetic algorithms.

Book Information

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Customer Reviews

This book uses tools from nonlinear systems theory to provide a comprehensive foundation for the theory of neural networks. The emphasis is on computational capabilities and learning abilities of neural networks. The unified perspective of nonlinear systems leads to a clear understanding of various architectures and learning methods, and the two chapters on learning provide valuable insight. In addition to the most common feed-forward networks, the book analyzes radial basis function networks, classifier networks, clustering networks, and various models of associative memory. The book is intended to be used for a first-year graduate course. The required background includes basic topics in mathematics, such as probability and statistics, differential equations, linear algebra, multivariate calculus, as well as some knowledge of state systems, Boolean algebra, and switching theory. --This text refers to an out of print or unavailable edition of this title.

Joshua D. Angrist is Ford Professor of Economics at MIT.

Book arrived perfectly.

Prof. Hassoum’s book is very good to introduce the reader in the mathematics of Artificial Neural Nets (ANN), including an interesting item explaining how to integrate Genetic Algorithms (GA) with Artificial Neural Networks (ANN) not found in this kind of work. Nevertheless, this is not a book for computing professionals because its necessary one to have a solid background on math to understand the ANN concepts along the chapters. Well written for mathematicians, it lacks pratical examples for better understanding the concepts explained in the book.

Prof. Hassoun’s book is almost the most complete book that builds a clear and broad foundation of neural networks. His unified approach to cast the problems of neural networks in a mathematical optimization models is excellent. The book is full of challenging and drill-like problems. The references cited blasts the door before the reader’s eyes to explore worlds of applications. Prof.

Hassoun's contribution to the field of Neural Networks is remarkable. After more than three years of taking two graduate courses using this book (and being lectured by Prof. Hassoun), I can hardly forget any detail. A excellent book which ideas get inscribed in your head. In a few word, The Bible of Neural Networks ...

I bought this book a while ago, and I must say that it has been a source of immense help in deepening my understanding of neural networks. Yes, if you buy this, you will clearly realize that it has 'severe' amounts of math on every page, but again, if you can figure the math out, other aspects of the book (especially coverage) generally make it worth the deal.

I feel it is a very good book over-all for Neural Networks. It is one of the very few books that I came across with an excellent description of Time Delay Neural Networks (TDNN) and the associated learning algorithms.

Fast shipping. Well packing and the conditions are as the same as the descriptions. Great seller!!

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