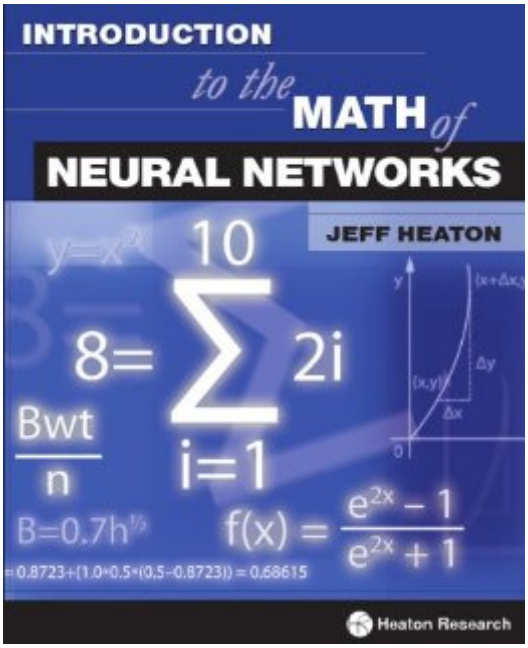
Introduction To The Math Of Neural Networks



Synopsis

This book introduces the reader to the basic math used for neural network calculation. This book assumes the reader has only knowledge of college algebra and computer programming. This book begins by showing how to calculate output of a neural network and moves on to more advanced training methods such as backpropagation, resilient propagation and Levenberg Marquardt optimization. The mathematics needed by these techniques is also introduced. Mathematical topics covered by this book include first, second, Hessian matrices, gradient descent and partial derivatives. All mathematical notation introduced is explained. Neural networks covered include the feedforward neural network and the self organizing map. This book provides an ideal supplement to our other neural books. This book is ideal for the reader, without a formal mathematical background, that seeks a more mathematical description of neural networks.

Book Information

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Customer Reviews

I’m not done reading yet but feel compelled to point out one problem to others: the display equations are too small, almost unreadable, on my Kindle Fire HD. The text of the book itself is adjustable in

size, as usual, but these other elements are not: Figures, code fragments, console output, and the aforementioned display equations. The figures are about right in size, but the code and output is too large. But, again, the worst problem is that the equations are like a thumbnail of a thumbnail in size -- making subscript and superscript letters nearly invisible.I've had similar issues with other technical books on the Kindle, but this is the worst example so far. If the author could boost the size of the equations 4x and perhaps reduce the size of the the code/program output, and reissue this otherwise very helpful guide, it would be greatly appreciated.Many thanks!

Its freshman calculus and applied math rolled together in a developing brew.that suggests but never leads to a specific process to design neural networks. This introduction is gentle and it will all make sense if you buy another few books on the subject. However, this is not a one stop shop for neural network design. The book is more a basic presentation of various mathematical tools that can be applied to neural networks.The book requires the reader to have familiarity with basic calculus and derivatives. Otherwise it's a walk in the park. After all, you are going to have to stretch a bit to benefit from this knowledge, so the effort is worth it. The title does say that this is an introduction, so don't be too disappointed that everything isn't laid out for you. There is no effort to categorize the functions introduced or to produce an overall design process of selection appropriate for a particular task. That information comes from further study in this area. Happy hunting.I would like to praise the author for making the functional application and training of the neural network simple enough to get the reader started. This is a complex and potentially confusing area of applied mathematics. As is advised in these areas, it is best to learn to walk before trying to run. This book will help the reader walk correctly along this path.Once you understand the proper processes, the world of application will open up for you. This material can be used in pattern recognition, financial forecasting image resolving, flight combat, and vehicle ride control. Buckle up and enjoy the flight.

This book is very uneven. It devotes initial chapters to explaining some basic mathematical ideas (e.g., what an "error" is, what a derivative of is) in unnecessary detail, but abandons the attempt to imbue understanding when it gets to the meat of the book -- the math behind neural networks. It is as though he ran out of time and stopped trying to explain just when explanations were needed. The gradient decent of back propagation could have been explained without deriving derivatives, but instead any insights into the math were lost in a recitation of algorithmic steps. To illustrate how these algorithms work, the author includes poorly formatted computer outputs with which show values to 8 decimal places when one or two would have been fine: the result was essentially

illegible and this made his explanations unintelligible. I was very disappointed.

Unlike many neural network textbook that really focuses on difficult concepts, this book is straightforward and focuses on practical knowledge. Definitely worth $10. Lastly, although the book says that you only need to know high school algebra to understand it, I highly recommend that you have some knowledge of calculus (if you are interested in neural networks, you probably do already).

I think this book exhibits the downside of self-publishing. The content exhibits the expertise that Heaton likely has, but the writing and order of presentation needs a few more rounds of careful editing. Mathematical notation tends to change without notice and concepts are used without explanation. I think all the pieces can be found within the book to make it a good self-contained piece of work, but the writing clearly needs editing by a fresh pair of eyes.I would instead suggest studying Richard Golden’s and Sandhya Samarasinge’s texts as a pair.

This book is a fantastic introduction to Neural Networks. I was able to understand its content with no formal math education. In addition, I think this is the best of Jeff Heaton’s work to date. I tried his Introduction to Neural Networks with Java and was unable to get through it. This book is a massive improvement. Removing Java from the equation massively reduces the complexity of the subject (full disclosure, I’m a Haskell developer). Additionally, Jeff’s writing has improved considerably, giving this book much more traction.

It is a very short book but it does a good job walking you through an example on how to build and train a simple neural network.It gives you a clear idea on how the programming looks like and I think it is a good hands-on start.For sure it is not enough, but it is good as a starting point.

Science (Kandel)) Deep Learning: Recurrent Neural Networks in Python: LSTM, GRU, and more RNN machine learning architectures in Python and Theano (Machine Learning in Python) Unsupervised Deep Learning in Python: Master Data Science and Machine Learning with Modern Neural Networks written in Python and Theano (Machine Learning in Python) Artificial Intelligence for Humans, Volume 3: Deep Learning and Neural Networks Convolutional Neural Networks in Python: Master Data Science and Machine Learning with Modern Deep Learning in Python, Theano, and TensorFlow (Machine Learning in Python) Deep Learning in Python: Master Data Science and Machine Learning with Modern Neural Networks written in Python, Theano, and TensorFlow (Machine Learning in Python) Deep Learning Neural Networks: Design and Case Studies Fusion of Neural Networks, Fuzzy Systems and Genetic Algorithms: Industrial Applications (International Series on Computational Intelligence) Kalman Filtering and Neural Networks Neural Networks: A Comprehensive Foundation (2nd Edition) Elements of Artificial Neural Networks (Complex Adaptive Systems) Cool Paper Folding: Creative Activities That Make Math & Science Fun for Kids!: Creative Activities That Make Math & Science Fun for Kids! (Cool Art with Math & Science) Math For Everyone Combo Book Hardcover: 7th Grade Math, Algebra I, Geometry I, Algebra II, Math Analysis, Calculus Math in Focus: Student Workbook 2A (Math in Focus: Singapore Math)