Deep Learning in Python: Master Data Science and Machine Learning with Modern Neural Networks written in Python, Theano, and TensorFlow (Machine Learning in Python)

LazyProgrammer

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Deep Learning

Deep learning is making waves. At the time of this writing (March 2016), Google's AlghaGo program just beat 9-dan professional Go player Lee Sedol at the game of Go, a Chinese board game.

Experts in the field of Artificial Intelligence thought we were 10 years away from achieving a victory against a top professional Go player, but progress seems to have accelerated!

While deep learning is a complex subject, it is not any more difficult to learn than any other machine learning algorithm. I wrote this book to introduce you to the basics of neural networks. You will get along fine with undergraduate-level math and programming skill.

All the materials in this book can be downloaded and installed for free. We will use the Python programming language, along with the numerical computing library Numpy. I will also show you in the later chapters how to build a deep network using Theano and TensorFlow, which are libraries built specifically for deep learning and can accelerate computation by taking advantage of the GPU.

Unlike other machine learning algorithms, deep learning is particularly powerful because it automatically learns features. That means you don't need to spend your time trying to come up with and test "kernels" or "interaction effects" - something only statisticians love to do. Instead, we will let the neural network learn these things for us. Each layer of the neural network learns a different abstraction than the previous layers. For example, in image classification, the first layer might learn different strokes, and in the next layer put the strokes together to learn shapes, and in the next layer put the shapes together to form facial features, and in the next layer have a high level representation of faces.

On top of all this, deep learning is known for winning its fair share Kaggle contests. These are machine learning contests that are open to anyone in the world who are allowed to use any machine learning technique they want. Deep learning is that powerful.

Do you want a gentle introduction to this "dark art", with practical code examples that you can try right away and apply to your own data? Then this book is for you.

Who is this book NOT for?

Deep Learning and Neural Networks are usually taught at the upper-year undergraduate level. That should give you some idea of the type of knowledge you need to understand this kind of material.

You absolutely need exposure to calculus to understand deep learning, no matter how simple the instructor makes things. Linear algebra would help. I will assume familiarity with Python (although it is an easy language to pick up). You will need to have some concept of machine learning. If you know about algorithms like logistic regression already, this book is perfect for you. If not, you might want to check out my “prerequisites” book, at: http://amzn.com/B01D7GDRQ2

On the other hand, this book is more like a casual primer than a dry textbook. If you are looking for material on more advanced topics, like LSTMs, convolutional neural networks, or reinforcement learning, I have online courses that teach this material, for example: https://www.udemy.com/deep-learning-convolutional-neural-networks-theano-tensorflow

New libraries like TensorFlow are being updated constantly. This is not an encyclopedia for these libraries (as such a thing would be impossible to keep up to date). In the one (1!!!) month since the book was first published, no less than THREE new wrapper libraries for TensorFlow have been released to make coding deep networks easier. To try and incorporate every little update would not only be impossible, but would continually cause parts of the book to be obsolete. Nobody wants that. This book, rather, includes fundamentals. Understanding these building blocks will make tackling these new libraries and features a piece of cake - that is my goal.

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