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# Deep Learning Books

by **Jason Brownlee** on April 7, 2016 in **Deep Learning**



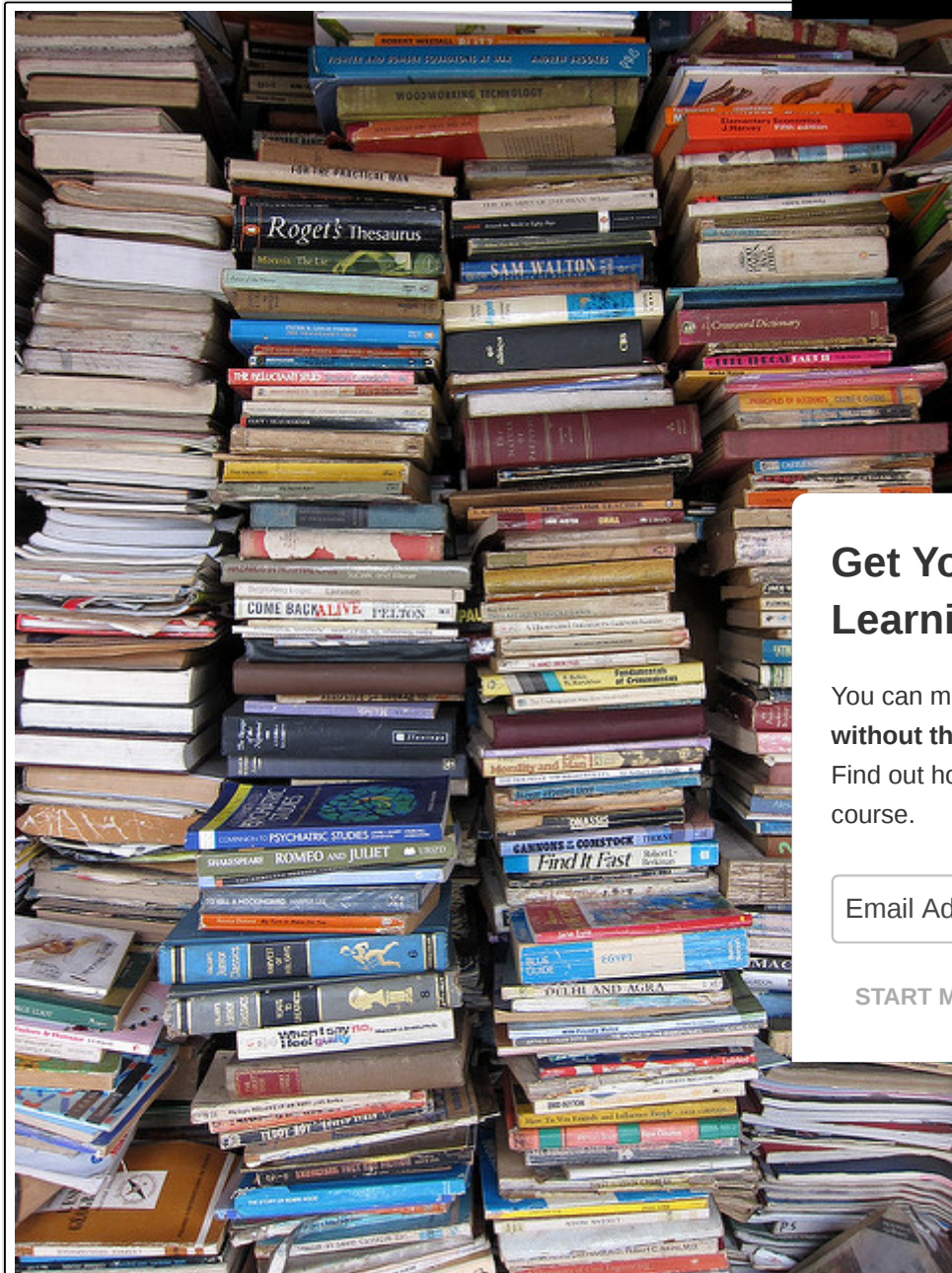
There are not many books on deep learning at the moment because it is such a young area of study.

There are a few books available though and some very interesting books in the pipeline that you can purchase by early access.

In this post, you will discover the books available right now on deep learning.

Let's get started.

[Get Your Start in Machine Learning](#)



Deep Learning Books (I wish)

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# Deep Learning Textbook

There is a deep learning textbook that has been under development for a few years called simply [Deep Learning](#).

It is being written by top deep learning scientists [Ian Goodfellow](#), [Yoshua Bengio](#) and [Aaron Courville](#) and includes coverage of all of the main algorithms in the field and even some exercises.

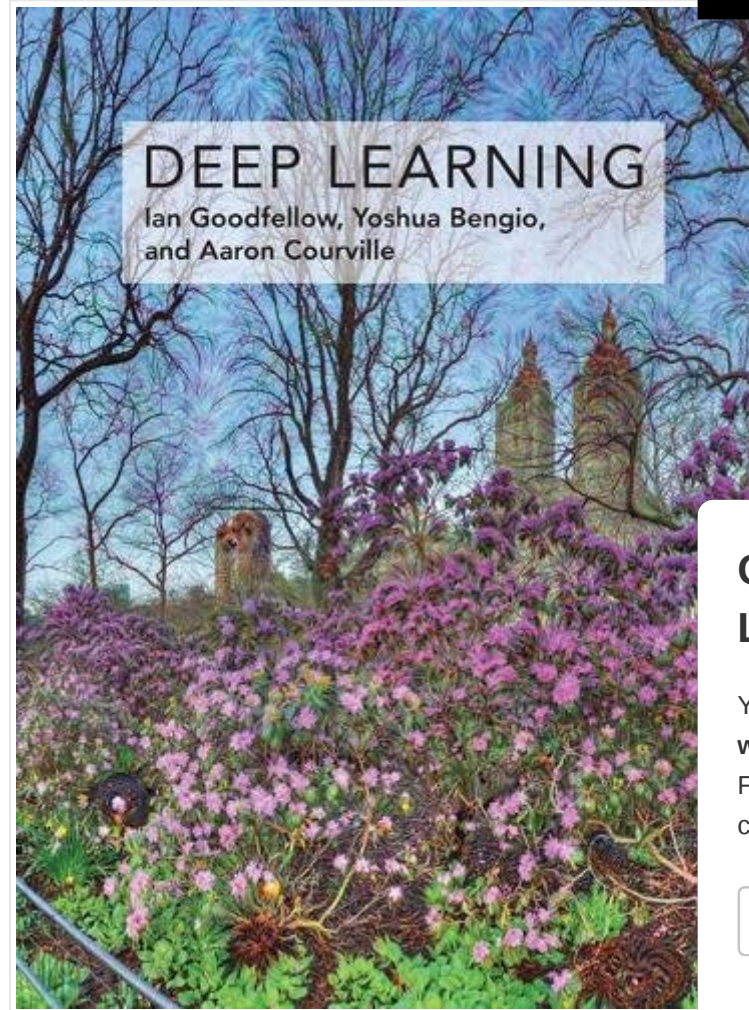
I think it will become the staple text to read in the field, primarily because they are giving it away for free (much like [The Elements of Statistical Learning](#) is required reading in Machine Learning).

A lot of it is complete already and I highly recommend reading it to get some background theory on deep learning algorithms.

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The current working table of contents looks as follows:

- Part I: Applied Math and Machine Learning Basics
  - Linear Algebra
  - Probability and Information Theory
  - Numerical Computation
  - Machine Learning Basics
- Part II: Modern Practical Deep Networks

- Deep Feedforward Networks
- Regularization
- Optimization for Training Deep Models
- Convolutional Networks
- Sequence Modeling: Recurrent and Recursive Nets
- Practical Methodology
- Applications
- Part III: Deep Learning Research
  - Linear Factor Models
  - Autoencoders
  - Representation Learning
  - Structured Probabilistic Models for Deep Learning
  - Monte Carlo Methods
  - Confronting the Partition Function
  - Approximate Inference
  - Deep Generative Models

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## Deep Learning Books from O'Reilly

There are currently two books from O'Reilly that are in the pipeline that I am excited about:



- [Deep Learning: A Practitioner's Approach](#)
- [Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms](#)

## Deep Learning: A Practitioner's Approach

This is an applied book written by two of the creators of DeepLearning4J: [Adam Gibson](#) and [Josh Patterson](#). [DeepLearning4J](#) (or DL4J) is the Deep Learning framework for Java applications.

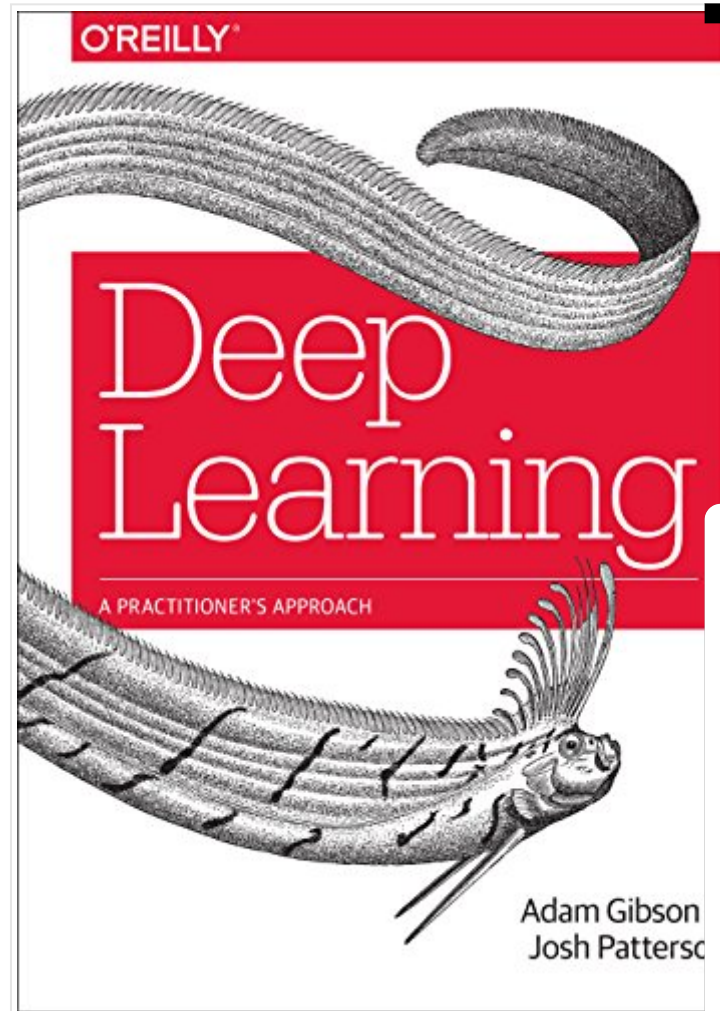
The book is practical, written for both Java developers and data scientists and I can only assume it provides examples using the DL4J framework.

The book is due out in May 2016 and there is currently no table of contents available (that I could find).

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## Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms

This is another applied book in Python written by [Nikhil Buduma](#). It covers both deep learning concepts and examples. You can get early access to this book and there are 5 chapters available at the time of writing.

The currently working table of contents for this book is listed below:

- The Neural Network
- Training Feed Forward Neural Networks

- Implementing Neural Networks in TensorFlow
- Beyond Gradient Descent
- Convolutional Neural Networks:
- Embedding and Representation Learning
- Deep Learning Models for Sequence Analysis
- Memory-Augmented Deep Learning Models
- Generative Deep Learning Models
- Deep Reinforcement Learning
- Towards General Unsupervised Learning
- Training Extremely Deep Neural Networks

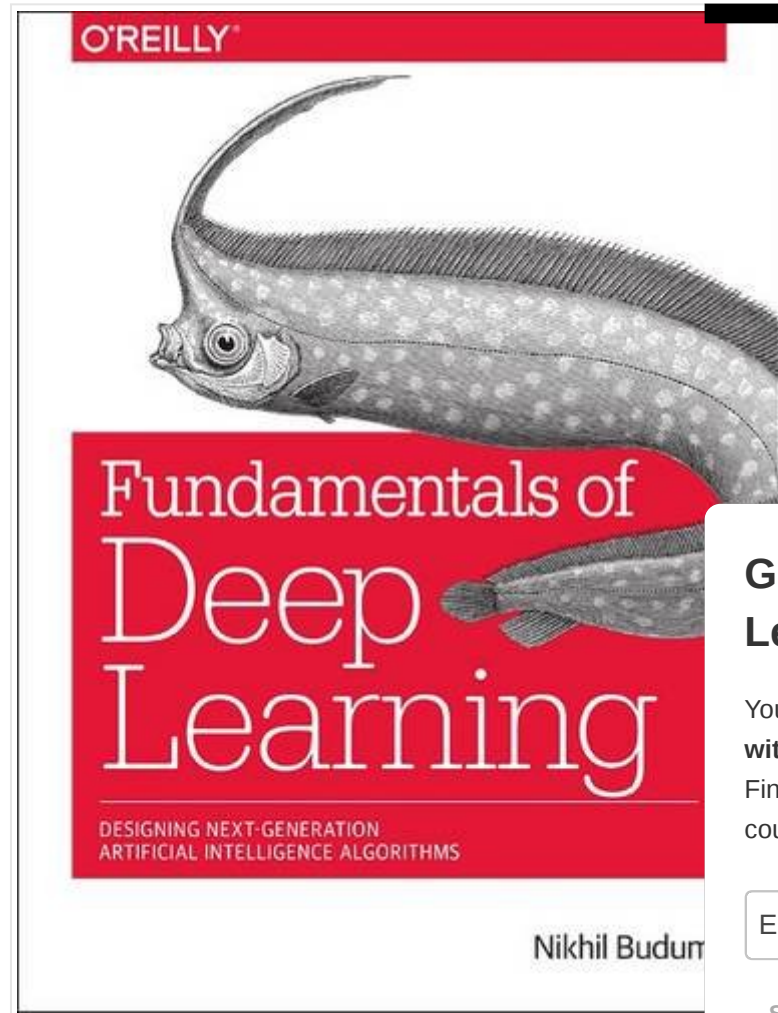
I'm excited to get my hands on this book.

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**O'REILLY**

**Fundamentals of Deep Learning**

DESIGNING NEXT-GENERATION ARTIFICIAL INTELLIGENCE ALGORITHMS

Nikhil Budur

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## Deep Learning from Packt Publishing

Packet publishing has a book coming out in May 2016 on Deep Learning written by [Yusuke Sugomori](#) titled [Deep Learning with Java](#). It is also targeting Java Developers and Data Scientists and will provide examples using the DeepLearning4J framework.

There does not appear to be a table of contents available for this book yet, but I believe you can [get early access to it](#).

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## Deep Belief Nets in C++ and CUDA C

[Timothy Masters](#) has written a number of books on artificial neural networks over the years. In 2015 he wrote two books on Deep Belief Networks using C++ and CUDA.

The books provide examples and are primarily focused on his software called DEEP. You can learn more about his software on his [webpage](#).

The two books are:

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## Deep Belief Nets in C++ and CUDA C: Volume 1: Restricted Boltzmann Machines and Supervised Feedforward Networks

The table of contents for this book is:

- Supervised Feedforward Networks
- Restricted Boltzmann Machines
- Greedy Training
- DEEP Operating Manual

## Deep Belief Nets in C++ and CUDA C: Volume II: Autoencoding in the Complex Domain

The table of contents for this book is:

- Embedded Class Labels
- Signal Preprocessing
- Image Preprocessing
- Autoencoding
- DEEP Operating Manual

## Artificial Intelligence for Humans

[Jeff Heaton](#) is a researcher and author of a series of three books on artificial intelligence:

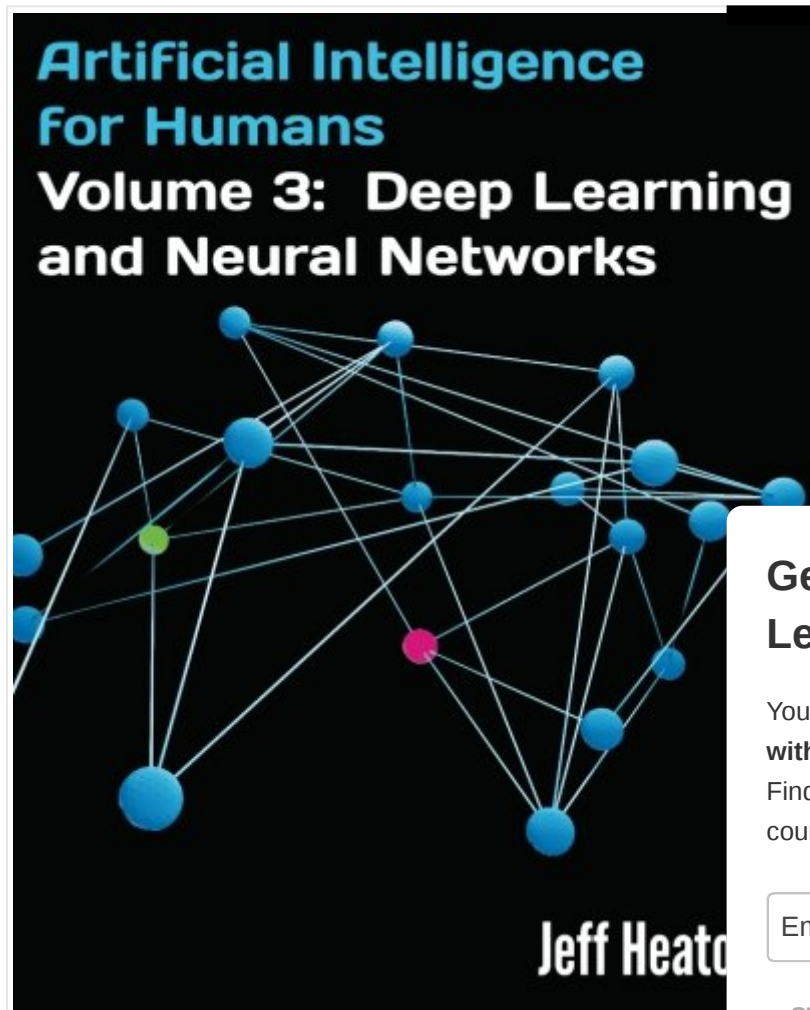
- [Artificial Intelligence for Humans, Volume 1: Fundamental Algorithms](#)
- [Artificial Intelligence for Humans, Volume 2: Nature-Inspired Algorithms](#)
- [Artificial Intelligence for Humans, Volume 3: Deep Learning and Neural Networks](#)

The third book in the series covers artificial neural networks and has a few chapters on deep learning.

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The table of contents looks as follows:

- Neural Network Basics
- Self-Organizing Maps
- Hopfield and Boltzmann Machines
- Feedforward Neural Networks
- Training and Evaluation
- Backpropagation Training

- Other Propagation Training
- NEAT, CPNN and HyperNEAT
- Deep Learning
- Convolutional Neural Networks
- Pruning and Model Selection
- Dropout and Regularization
- Time Series and Recurrent Networks
- Architecting Neural Networks
- Visualization
- Modeling with Neural Networks

Generally, Jeff is a good communicator and his books get attention from the community because he [used Kickstarter](#) in the process to create them. The third part of his series might be a good read if you are looking for an introduction to neural networks

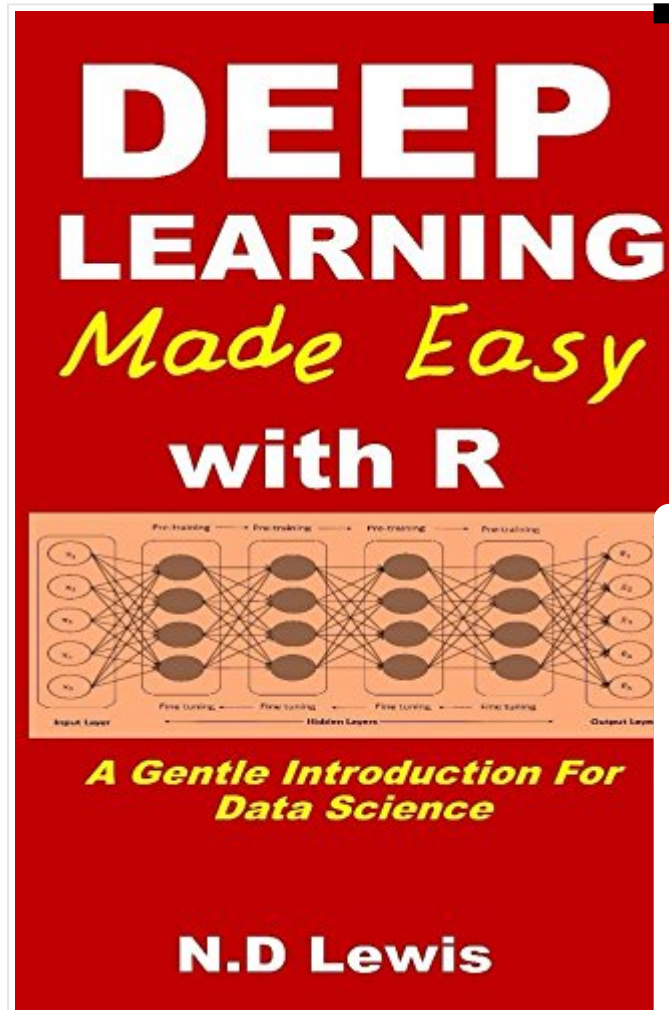
## Deep Learning in R

N. D. Lewis has a series of books on statistics and machine learning including books on neural networks. His book on Deep Learning in R is titled: [Deep Learning Made Easy with R: A Gentle Introduction for Data Science..](#)

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The table of contents looks as follows:

- Deep Neural Networks
- Elman Neural Networks
- Jordan Neural Networks
- The Secret to the Autoencoder
- The Stacked Autoencoder in a Nutshell
- Restricted Boltzmann Machines

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- [Deep Belief Networks](#)

## Update: More Books

This section lists addition books that have been released (or are expected to be released) after this post was written.

- [Neural Networks and Deep Learning](#)
- [Grokking Deep Learning](#)
- [Machine Learning with TensorFlow](#)
- [TensorFlow Machine Learning Cookbook](#)
- [Getting Started with TensorFlow](#)
- [Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques for Building Intelligent Systems](#)

## Summary

In this post you discover the books that are available right now on deep learning.

Have you purchased or read one of these books? Leave a comment and let me know what you think.

Are there any more books on deep learning that you know are coming or already here? Let me know.

## Frustrated With Your Progress In Deep

### What If You Could Develop A Network in Minutes

...with just a few lines of Python

Discover how in my new Ebook: [Deep Learning With Python](#)

It covers **self-study tutorials** and **end-to-end projects** on topics like:

*Multilayer Perceptrons, Convolutional Nets and Recurrent Neural Nets*, and more...

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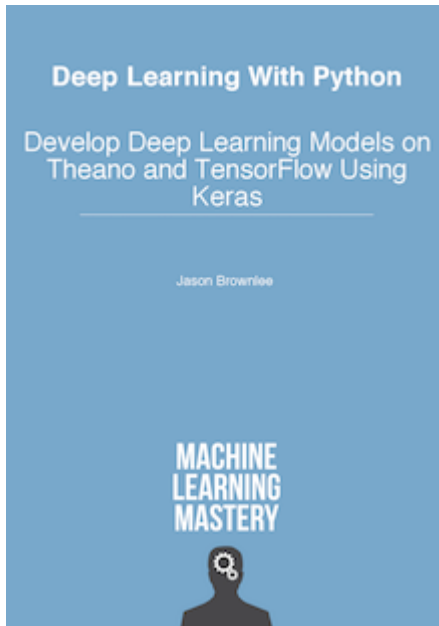
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### About Jason Brownlee

Dr. Jason Brownlee is a husband, proud father, academic researcher, author, professional, dedicated to helping developers get started and get good at applied machine learning.

[Learn more.](#)

[View all posts by Jason Brownlee](#) →

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[◀ Linear Discriminant Analysis for Machine Learning](#)

[Classification And Regression Trees for Machine Learning ▶](#)

[Get Your Start in Machine Learning](#)

## 14 Responses to *Deep Learning Books*



**Matt Davey** April 7, 2016 at 7:45 am #

REPLY ↩

Any particular books that are more helpful to H2O users?



**Jason Brownlee** April 8, 2016 at 1:36 pm #

REPLY ↩

Sorry Matt, I have not used H2O. I believe they have their own free mini-book/guide that you



**Raymond Peck** November 17, 2016 at 8:57 am #

<http://docs.h2o.ai/h2o/latest-stable/h2o-docs/booklets/DeepLearningBooklet.pdf>

Note that the Deep Water project is adding TensorFlow, mxnet and Caffe underneath H2O, so stay tuned

<https://www.youtube.com/watch?v=b52wkC8f3io>



**Jason Brownlee** November 17, 2016 at 9:58 am #

Thanks for the links Raymond.



**Daniel Gallagher** April 8, 2016 at 6:43 am #

REPLY ↩

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Get Your Start in Machine Learning

I'm just beginning to learn about deep learning and this is exactly what I need, thank you! I'm curious as to your favourite book from the list? The first one sounds very promising.



**Jason Brownlee** April 8, 2016 at 1:34 pm #

REPLY ↩

The first book is excellent and the place to start. But it is not for everyone as it is a textbook and more academically focused.



**Jordi Torres** April 18, 2016 at 3:49 am #

REPLY ↩

<https://www.quora.com/What-are-the-best-online-available-books-that-cover-beginner-intermediate-levels-of-deep-learning?share=df8b0d1>

Viñals?share=df8b0d1

There are not many books on Deep Learning at the moment because it is such a young area of study. Here are 3 books that cover beginner, intermediate and advanced levels:

- 1- Advanced level: "Deep Learning" written by top deep learning scientists Ian Goodfellow, Yoshua Bengio and Aaron Courville. This book covers all of the main algorithms in the field and can be used as a reference book by those who have experience in Machine Learning and want to delve into Neural Networks.
- 2- Intermediate level: "Neural Networks and Deep Learning" written by Michael Nielsen. The book is a good introduction to the field of Machine Learning and is suitable for those with some experience in Machine Learning and want to delve into Neural Networks.
- 3- Beginner level: "FIRST CONTACT WITH TENSORFLOW, get started with Deep Learning programming with TensorFlow" written by François Fleuret. This book is aimed at engineers with only some basic understanding of Machine Learning who want to expand their wisdom in the field of Machine Learning using an approach that uses TensorFlow.

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**Jason Brownlee** June 23, 2016 at 10:27 am #

REPLY ↩

Thanks Jordi.

**Ryan Herr** April 21, 2016 at 11:00 pm #

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The Nature of Code by Daniel Shiffman, Chapter 10: Neural Networks. Available free online: <http://natureofcode.com/book/chapter-10-neural-networks/>



**Jason Brownlee** June 23, 2016 at 10:26 am #

REPLY ↩

Thanks Ryan.



**Saad Taame** September 3, 2016 at 11:47 pm #

REPLY ↩

You can add Michael Nielsen's awesome book to the list. The book's title is : Neural Networks and Deep Learning available online through the author's web page.

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**Jason Brownlee** September 4, 2016 at 8:05 am #

Thanks Saad.



**ram** November 27, 2016 at 8:30 pm #

Hi i want to ask what mathematic fields are required for starting machine learning and deep learning. What are the books needed for mathematics.



**Jason Brownlee** November 28, 2016 at 8:44 am #

REPLY ↩

I teach a top-down and results first approach where we do not start with math, but instead focus on how to build models and make predictions

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More details here:

<http://machinelearningmastery.com/start-here/#getstarted>

## Leave a Reply

Name (required)

Email (will not be published) (required)

Website

SUBMIT COMMENT

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My goal is to make practitioners like YOU awesome at applied machine learning.

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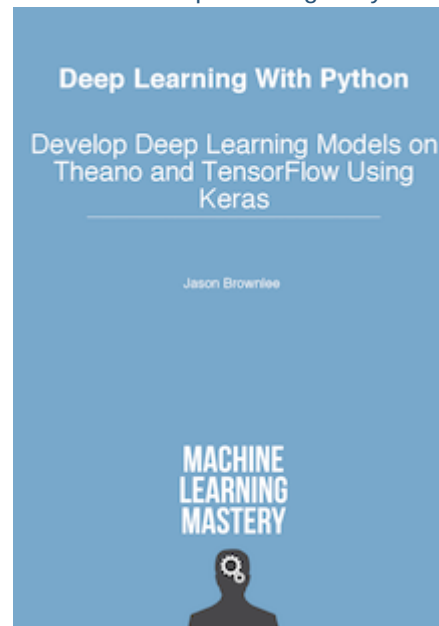




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### POPULAR



Time Series Prediction with LSTM Recurrent Neural Networks in Python with Keras

JULY 21, 2016

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**Your First Machine Learning Project in Python Step-By-Step**

JUNE 10, 2016

**Develop Your First Neural Network in Python With Keras Step-By-Step**

MAY 24, 2016

**Multivariate Time Series Forecasting with LSTMs in Keras**

AUGUST 14, 2017

**How to Setup a Python Environment for Machine Learning and Deep Learning with Anaconda**

MARCH 13, 2017

**Sequence Classification with LSTM Recurrent Neural Networks in Python with Keras**

JULY 26, 2016

**Time Series Forecasting with the Long Short-Term Memory Network in Python**

APRIL 7, 2017

**Regression Tutorial with the Keras Deep Learning Library in Python**

JUNE 9, 2016

**Multi-Class Classification Tutorial with the Keras Deep Learning Library**

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**How to Grid Search Hyperparameters for Deep Learning Models in Python With Keras**

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