Deep Learning · Computer Science · Learning

How can I learn Deep Learning quickly?

Answer | Request | Follow 134 | Comment | Share | Downvote

12 Answers

Vivek Kumar, Using it for my work
Written Sep 7, 2016

Here are 4 Step plan for learning Deep Learning

Firstly, if you need some basic information or convincing on why Deep Learning is having a significant impact, check out the following video by Andrew Ng

Step 0: Learn Machine Learning Basics

(Optional but recommended)

Start with Andrew Ng's Class on machine learning https://www.coursera.org/learn/m... . His course provides an introduction to various Machine Learning algorithms are out there and, more importantly, the general procedures/methods for machine learning, including data preprocessing, hyper-parameter tuning, etc.

Read the NIPS 2015 Deep Learning Tutorial by Geoff Hinton, Yoshua Bengio, and Yann LeCun for an introduction at a slightly lower level.

Step 1: Dig into Deep Learning

My learning preference is to watch lecture videos and thankfully there are several excellent courses online. Here are few classes I liked

- Deep learning at Oxford 2015 Taught by Nando de Freitas who expertly explains the basics, without overcomplicating it. Start with Lectures 9 if you are already familiar with Neural Networks and want to go deep. He uses Torch framework in his examples. (Videos on Youtube)
- Neural Networks for Machine Learning : Geoffrey Hinton's class on Coursera. Hinton is an excellent researcher who demonstrated the use of generalized backpropagation algorithm and was crucial to the development of deep learning . I have utmost respect for him, but I found the delivery of this course bit unorganized. Furthermore, coursera messes up with the placement of quizzes.
- Neural Networks Class by Hugo Larochelle: Another excellent course
- Yaser Abu-Mostafa's machine learning course : More theory if you are interested.

- Neural Networks and Deep Learning Book by Michael Nielsen's : Online book and has several interactive JavaScript elements to play with.
- Deep Learning Book by Ian Goodfellow, Yoshua Bengio and Aaron Courville: Bit denser but never the less a great resource

Step 10: Pick a focus area and go deeper

Identify what you are passionate about and go deeper. The field is vast, so this list is in no way a comprehensive list.

1. Computer vision

Deep learning has transformed this area. Stanford's CS231N course by Andrej Karpathy's course is the best course I have come across; CS231n Convolutional Neural Networks for Visual Recognition . It teaches you the basics and up to covnets, as well as helping you to set up GPU instance in AWS. Also, check out Getting Started in Computer Vision by Mostafa S. Ibrahim

2. Natural Language Processing (NLP)

Used for machine translation, question and answering, sentiment analysis. To master this field, an in-depth understanding of both algorithms and the underlying computational properties of natural languages is needed. CS 224N / Ling 284 by Christopher Manning is a great course to get started. CS224d: Deep Learning for Natural Language Processing , another Stanford class by David Socher (founder of MetaMind)is also an excellent course which goes over all the latest Deep learning research related to NLP. For more details see How do I learn Natural Language Processing?

3. Memory Network (RNN-LSTM)

Recent work in combining attention mechanism in LSTM Recurrent Neural networks with external writable memory has meant some interesting work in building systems that can understand, store and retrieve information in a question & answering style. This research area got its start in Dr. Yann Lecun's Facebook AI lab at NYU. The original paper is on arxiv: Memory Networks . There're many research variants, datasets, benchmarks, etc that have stemmed from this work, for example, Metamind's Dynamic Memory Networks for Natural Language Processing

4. Deep Reinforcement Learning

Made famous by AlphaGo, the Go-playing system that recently defeated the strongest Go players in history. David Silver's (Google Deepmind) Video Lectures on RL and Professor Rich Stutton's Book is a great place to start. For a gentle introduction to LSTM see Christopher's post on Understanding LSTM networks & Andrej Karpathy's The Unreasonable Effectiveness of Recurrent Neural Networks

5. Generative Models

While discriminatory models try to detect, identify and separate things, they end up looking for features which differentiate and do not understand data at a fundamental level. Apart from the short-term applications, generative models provide the potential to automatically learn natural features; categories or dimensions or something else entirely. Out of the three commonly used generative models—Generative Adversarial Networks (GANs) , Variational Autoencoders (VAEs) and Autoregressive models (such as PixelRNN) , GAN's are most popular. To dig deeper read

- Original GAN paper by Ian Goodfellow *et al* .
- The Laplacian Adversarial Networks (LAPGAN) Paper (LAPGAN) which fixed the stability issue
- The Deep Convolutional Generative Adversarial Networks (DCGAN) paper and DCGAN Code which can be used to learn a hierarchy of features without any supervision. Also, check out DCGAN used for Image Superresolution

Step 11: Build Something

- As is tradition, start with classifying the MNIST dataset
- Try face detection and classification on ImageNet . If you are up to it, do the ImageNet Challenge 2016 .
- Do a Twitter sentiment analysis using RNNs or CNNs
- Teach neural networks to reproduce the artistic style of famous painters (A Neural Algorithm of Artistic Style)
- Compose Music With Recurrent Neural Networks
- Play ping-pong using Deep Reinforcement Learning
- Use Neural Networks to Rate a selfie
- Automatically color Black & White pictures using Deep Learning

For more inspiration, take a look at CS231n Winter 2016 & Winter 2015 projects. Also keep an eye on the Kaggle and HackerRank competitions for fun stuff and the opportunities to compete and learn.

Additional Resources

Here are some pointers to help you with continuous learning

- Read some excellent blogs. Both Christopher Olah's blog & Andrew Karpathy's Blog do a great job of explaining basic concepts and recent breakthrus
- Follow influencers on Twitter. Here are a few to get started @drfeifei, @ylecun, @karpathy, @AndrewYNg, @Kdnuggets, @OpenAI, @googleresearch. (see: Who to follow on Twitter for machine learning information ?)
- Google+ Deep Learning Community Page, by Yann Lecunn, is a good way to keeping in touch with innovations in deep learning as well as communicating with other deep learning professionals and enthusiasts.

See ChristosChristofidis/awesome-deep-learning , a curated list of awesome Deep Learning tutorials, projects and communities for more fun

8.5k Views · View Upvotes

Upvote 99 Downvote Comment

Thia Kai Xin, Data scientist at Lazada, Co-Founder of DataScience SG.
Written Jun 26, 2016

Deep learning is a difficult topic so don't expect to learn it that quickly. But certainly you can try to learn it in a systematic way:

1. Start with Udacity course by Google on deep learning
2. Study the Deep Learning Textbook
3. Find an interesting application of deep learning.

- Deep learning NLP by Stanford is a good start. Link to lecture videos .
- Reinforcement Learning | Udacity is another interesting way to apply deep learning concepts to machine learning.

1. Explore further with What are the best resources to learn about deep learning?

1.9k Views · View Upvotes

Upvote 8 Downvote Comment

Parag K Mital, Director of Machine Intelligence @ Kadenze, Inc.
Written Sep 1, 2016

Originally Answered: How do I learn deep learning?

Unlike other courses, this is an application-led course, teaching you fundamentals of Tensorflow as well as state-of-the-art algorithms by encouraging exploration through the development of creative thinking and creative applications of deep neural networks. We've already built a very strong community with an active forum and Slack, where students are able to ask each other questions and learn from each others approaches on the homework. I highly encourage you to try this course. There are plenty of *GREAT* resources for learning Tensorflow. But this is the only comprehensive online course that will both teach you how to use Tensorflow and develop your creative potential for understanding how to apply the techniques in creating Neural Networks.

Course Information:

This course introduces you to deep learning: the state-of-the-art approach to building artificial intelligence algorithms. We cover the basic components of deep learning, what it means, how it works, and develop code necessary to build various algorithms such as deep convolutional networks, variational autoencoders, generative adversarial networks, and recurrent neural networks. A major focus of this course will be to not only understand how to build the necessary components of these algorithms, but also how to apply them for exploring creative applications. We'll see how to train a computer to recognize objects in an image and use this knowledge to drive new and interesting behaviors, from understanding the similarities and differences in large datasets and using them to self-organize, to understanding how to infinitely generate entirely new content or match the aesthetics or contents of another image. Deep learning offers enormous potential for creative applications and in this course we interrogate what's possible. Through practical applications and guided homework assignments, you'll be expected to create datasets, develop and train neural networks, explore your own media collections using existing state-of-the-art deep nets, synthesize new content from generative algorithms, and understand deep learning's potential for creating entirely new aesthetics and new ways of interacting with large amounts of data.

SCHEDULE

Course runs July 21, 2016 - December 31, 2016

Will be relaunched again as soon as the last session has ended so be sure to enrol for information!

Session 1: *Introduction To Tensorflow* (July 21, 2016)
We'll cover the importance of data with machine and deep learning algorithms, the basics of creating a dataset, how to preprocess datasets, then jump into Tensorflow, a library for creating computational graphs built by Google Research. We'll learn the basic components of Tensorflow and see how to use it to filter images.

Session 2: *Training A Network W/ Tensorflow* (August 2, 2016)
We'll see how neural networks work, how they are "trained", and see the basic components of training a neural network. We'll then build our first neural network and use it for a fun application of teaching a neural network how to paint an image, and explore such a network can be extended to produce different aesthetics.

Session 3: *Unsupervised And Supervised Learning* (August 16, 2016)
We explore deep neural networks capable of encoding a large dataset, and see how we can use this encoding to explore "latent" dimensions of a dataset or for generating entirely new content. We'll see what this means, how "autoencoders" can be built, and learn a lot of state-of-the-art extensions that make them incredibly powerful. We'll also learn about another type of model that performs discriminative learning and see how this can be used to predict labels of an image.

Session 4: *Visualizing And Hallucinating Representations* (August 30, 2016)
This sessions works with state of the art networks and sees how to understand what "representations" they learn. We'll see how this process actually allows us to perform some really fun visualizations including "Deep Dream" which can produce infinite generative fractals, or "Style Net" which allows us to combine the content of one

Session 5: *Generative Models* (September 13, 2016)
The last session offers a teaser into some of the future directions of generative modeling, including some state of the art models such as the "generative adversarial network", and its implementation within a "variational autoencoder", which allows for some of the best encodings and generative modeling of datasets that currently exist. We also see how to begin to model time, and give neural networks memory by creating "recurrent neural networks" and see how to use such networks to create entirely generative text.

Arindam Paul, Graduate Researcher in Machine Learning, Northwestern University
Written Jul 3, 2016

Books:

I would recommend this book by Jeff Heaton Deep Learning and Neural Networks: Jeff Heaton: 9781505714340: Amazon.com: Books . It is not a fancy book with lot of math but if you want to understand the basic concepts of deep learning, I would highly recommend it. It is a good example of how to communicate science to a general audience. Next, I recommend Dr. Quoc V. Le's ({PhD Student of Andrew Ng, one of the pioneers of Deep Learning) https://cs.stanford.edu/~quocle/... , https://cs.stanford.edu/~quocle/...

If you are someone who is comfortable with your math in Machine learning, you can read the Deep Learning book Deep Learning

Video:

I like Jeff Dean's talk at Google.

I recently started watching this. I have not watched the entire series but looks decent.

499 Views · Answer requested by Andrew Jeon

Upvote Downvote Comment

Shehroz Khan, PhD, CS
Written Jun 30, 2016

If you are a quick learner and have the following background, you will learn DL and ML quickly

Shehroz Khan's answer to How do I learn machine learning? Still that "quickly" does not mean hours, or weeks, it could be several months (and most likely years) before you may learn something meaningful and substantial.

543 Views · View Upvotes · Answer requested by Andrew Jeon

Upvote 1 Downvote Comment

Davide Testuggine, Applied Research Scientist at Facebook (2017-present)
Written Sep 14, 2016

Originally Answered: How do I learn deep learning in 1 month?

If you had no exposure to "normal" machine learning, I really don't you think you can. Besides, the field is still very fluid: it's hard to keep up with all the innovation there is.

If I still haven't managed to dissuade you, Ian Goodfellow and Yoshua Bengio have written a nice textbook on the subject. It's not short, but if you really want to try I think this is your best bet.

454 Views · View Upvotes

Upvote 4 Downvote Comment 1

Pranav Goel, B. Tech. Computer Science and Engineering, Indian Institute of Technology Varanasi (2018)
Written Jun 8, 2016

Originally Answered: What is the best way to learn Deep learning?

You could follow this link.

7 Steps to Understanding Deep Learning

P.S - I myself have just begin to start learning the concepts involved in this very exciting area. So, I do not really have the experience to answer your question in the best possible way... but this link does seem very useful.

Hope this helps :)

307 Views

Upvote Downvote Comment

Tésia Thomas, Independent Scientist, Inventor, & Engineer
Written Sep 14, 2016

Originally Answered: How do I learn deep learning in 1 month?

Deep learning is a very green field and thus still in progress. **Can't teach what hasn't been completed...which means you can't *learn* it specifically.** It is not rigorously defined. There's no limiting scope/factor determined. It's so exciting, right!!!! :)

But, you can learn to program (comp sci), math, chemistry, biology, neuroscience, etc.

Right now the field is also so vast because **its components haven't been fully formed/vetted**. You can actually ***create*** them if you jump in early enough with nifty enough ideas.

Best of luck. You can do it! :)

I think it's best to have ideas about it and to test those. **When fields are new, theories rule... until you know enough to rule them out**- really, it's a near impossible task

Related Questions

- How can I learn deep learning?
- What are the best resources to learn about deep learning?
- How do I learn deep learning in 2 months?
- Is deep learning creative?
- How did Jeff Dean switch from infrastructure and systems engineering to deep learning so quickly?
- What is deep learning?
- Is deep learning overhyped?
- Can I use deep learning to learn deep learning?

403 Views

Upvote Downvote Comment

Moustafa Alzantot, Graduate Student Researcher at University of California, Los Angeles
Written Aug 17, 2016

Originally Answered: How do I learn deep learning?

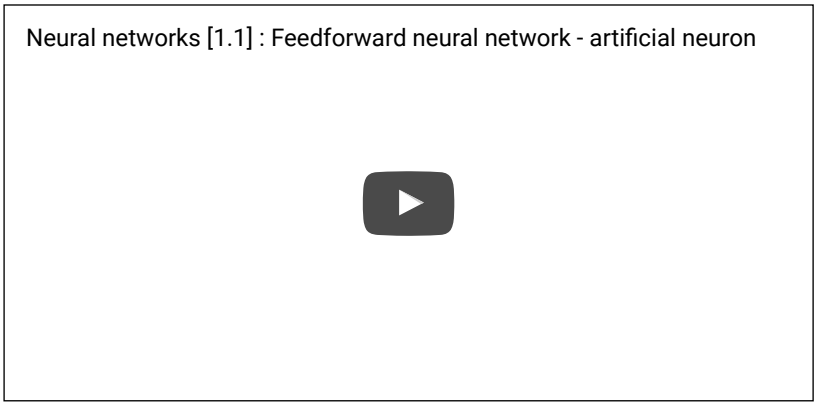
Check: Moustafa Alzantot's answer to What would you recommend to a beginner in deep learning? Which books? Which tools shall be used?

468 Views

Upvote Downvote Comment

Anonymous
Written Jul 3, 2016

Hugo Larochelle's course is excellent. If you complete all the videos, you'll go from being a noob in the area to someone who would be easily able to understand any recent research paper in the field.



224 Views · View Upvotes

Upvote 2 Downvote Comment

Sohaib Arif, Doing masters in Computer Science with ML focus
Written Jun 23, 2016

A quick way would be to go to http://www.cs231n.github.io and read the notes and attempt the assignments.

192 Views · Answer requested by Andrew Jeon

Upvote Downvote Comment

E. Burak Dündar
Written Aug 16, 2016

Originally Answered: How do I learn deep learning?

What are some good books/papers for learning deep learning?

257 Views

Upvote Downvote Comment

4 Answers Collapsed (Why?)

Top Stories from Your Feed

Answer written · Computer Science · 2016

Peter Norvig: In what ways has AI evolved that you didn't expect over your lifetime?

Peter Norvig, Research Director at Google

Answer written · Machine Learning · 2016

Is AI / ML all about mathematics?

Roman Trusov, Facebook AI Research Intern 2016

Answer written · Machine Learning · Apr 3

What are Andrew Ng's most notable contributions in the field of artificial intelligence?

Ismail Elezi, Computer Science student