Review of Machine Learning course by Andrew Ng and what to do next

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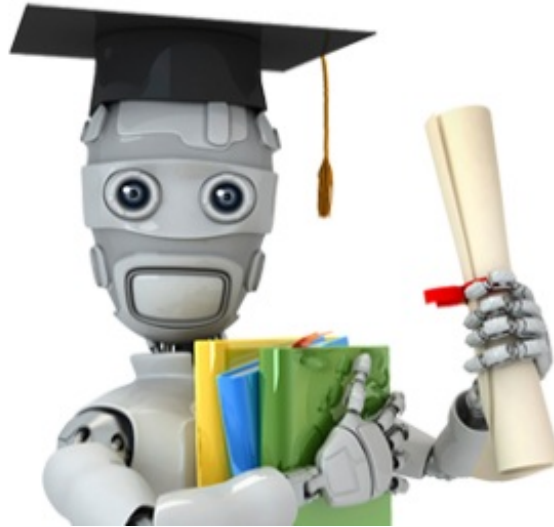
"AI is the new electricity". It is going to change the world the way electricity did a hundred year ago. If you want to learn AI, start a career and looking for a good course to start then keep reading, this blog is written for you. I recently completed this course, and I can say I have yet to see another online course on ML that comes near it in terms of quality of content, delivery and assignments.

Brief Introduction of Instructor

Andrew Ng is one of the world's best known AI experts. In 2011 he founded the CourseEra. Previously, he was head of AI Division at Baidu (A Chinese research engine). *Just to give you an idea of how bigger impact Andrew has in AI, Baidu lost $1.5 Billion in value due to his resignation*.

How much Math you need to know

Machine Learning highly depends on *Linear Algebra, Calculus, Probability Theory, Statistics, Information Theory.* But don't get scared, you don't need to have a background in all of these Math's fields to start learning ML. If you have studied basic Linear Algebra, Probability and Calculus in university or high school, you are good to go. If you need to refresh your concepts of Linear Algebra, I would highly recommend watching these excellent videos *"Essence Of Linear Algebra"*. Khan Academy was also helpful to clear some of my concepts.

Contents of Course

This course covers the following topics in ML

- **Supervised Learning**

Linear regression, logistic regression, neural networks, SVMs.

- **Unsupervised Learning**
  K-means, PCA, Anomaly detection
- **Special Applications/ Topic**s
  Recommender system, large scale machine learning
- **Advice on building a machine learning system**
  Bias/variance, regularization, evaluation of learning algorithm, learning curves, error analysis, ceiling analysis.

In my opinion, the most important part of the course is the 4th one, which highlights all of the tools, tricks, and tips that you will need to build the state of the art ML system. While solving a real problem using ML, you will often find yourself stuck at some issue, this is where these tools will come to rescue. I haven't seen any online course discussing this important topic in such a detail.

Delivery Method

This course is very interactive and highly involving, you should be ready to spend 5–7 hours/week to get the most out of this course.

Video Lecture and Quizzes

Each lecture consists of multiple videos with average length of 10–15 minutes. Almost every video has a quiz question to help you make sure that you understand the concept covered in the video. At the end of the each lecture there is also a quiz. Lecture notes under Resource section provide a great reference for topics covered in lecture.

Assignments

Assignments are the really fun part of this course, they come with the pre-setup environment in which you need to add the snippet of code, usually the implementation of concepts you learned during lecture. You can use Matlab (paid software) or Octave(free software) to do the assignments. If you already have access to Matlab then use it. If not, no need to spend the money just use octave.

What to do after this course

After the completion of this course successfully, you will have an expert level of understating concepts of ML. But there is a lot more to do on the implementation side.

Learn ML in Python

You might not be surprised to know that almost no company uses Matlab/Octave in their production ML models. Most of the time they are just used to build the prototype. In a production environment, Python or R is used. I would recommend going for Python, since it is easy to learn and widely used by big companies (Google, Amazon, Microsoft).

I would recommend going through the first 11 chapter of an amazing book.

<u>Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems</u>.

This book is written by one of ex-googler and considered the one of the best books on the topic.
 Since you already you know all of the concepts, you will be done with these chapters in one or two weeks.

Move to Deep Learning

Deep learning is a specialized field for ML which has become very popular in last couple of years. If you want to start a career in AI you, will need to have sound knowledge of this field.
There are two great MOOCs available online that cover the topic very well.

1. <u>Deep Learning Specialization</u> by Andrew Ng.
2. <u>Practical Deep Learning for Coders</u> by Jeremy

After reading <u>this</u> great blog by <u>Arvind N</u>, I decided to take the part 1 of Practical Deep Learning for coders and then move Andrew Ng specialization.

Forums and persons to follow

- Join <u>Kaggle</u>, it is one of the worlds best community of data scientist, Kaggle holds data science competition regularly. You will learn a lot from competition kernels.
- On LinkedIn, I follow <u>Andriy Burkov</u>, <u>Eric Weber</u>, <u>Matthew Mayo</u>,
- On Medium, I find <u>Towards Data Science</u> page very helpful. They often publish great tutorials, one of my favorite author is <u>Arden Dertat</u>.

Conclusion

Starting a career in AI is not very hard. Quality material is available online, all you have to do stay motivated and patient, at the end it all worth it.

Thank for reading, do let me know your thoughts in comments.