Data scientist or machine learning engineer? Which is a better career option?

In the 21st century, the world revolves around data, hundreds and thousands of data. So, it becomes quite natural for that data to be processed and to serve this purpose, powerful devices have become a necessity. Now, these machines should be automated or these systems should be designed in such a way that these devices should automatically be successful in processing these data. So, in order to build these systems, we require professionals like Machine learning engineers and Data scientists. Now, this is where the importance of data science and machine learning lies. There has been much confusion when it comes to data science vs machine learning and between the roles and responsibilities of data scientist and that of a machine learning engineer because these both terms are comparatively new in the technology industry. However, if you delve deeper into these two things then we are bound to find some major difference between data science and machine learning.

Artificial Intelligence

Machine Learning

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AI aims to make a smart computer system like humans, to solve complex problems.

ML allows machines to learn from data so that they can give accurate output.

Based on capability, AI can be divided into three types. Weak AI, General AI, and Strong AI.

ML is also divided into 3 types- Supervised learning, Unsupervised learning, and Reinforcement learning.

AI systems are concerned with maximizing the chances of success.

Machine learning is mainly concerned with accuracy and patterns.

AI enables a machine to simulate human behavior.

Machine learning is a subset of AI.

Mainly deals with structured, semi-structured, and unstructured data.

ML deals with structured and semi-structured data.

Applications of AI are Siri, customer support using catboats, intelligent humanoid robots, etc.

Applications of ML are recommendation systems, search algorithms, Facebook auto friend tagging suggestions, etc.

Data Scientists and their significance

Data science is often defined as the description, prediction and manipulation of data both in the structured and unstructured form. This process helps the business companies and organizations in taking business related decisions for the benefit of the company. Some might also describe it as the study of how data originates, what it represents and how it can be used to transform into valuable resources and in order for that to happen data science technology is used to mine huge amount of data to figure out the patterns that will help businesses have an advantage over others, have a look at new opportunities in the market, increase efficiencies, and many such benefits.
There are many definitions that are used when it comes to defining data scientists but if we have to sum up in a few words, data scientists are simply the professionals who are involved with the art of data science. Data scientist responsibilities include solving complex problems and scenarios with their expertise in scientific disciplines. The roles and responsibilities of a data scientist also include special areas where skills are required such as speech analytics, text, image and video processing, etc. Each of these roles and responsibilities of a data scientist are very limited in number and therefore the positions for these specialists are of great value and thus very in demand in the market. In short, whenever a question is needed to be answered or a problem is needed to be solved in a business, a data scientist is the one they go to as data scientists gather, derive and process these data to derive valuable insights from the data.

Machine Learning Engineers and their significance

Machine learning is the branch of artificial intelligence that deals with the class of data-driven algorithms that enable the software or systems to accurately predict the results of an operation without the intervention of humans or pre-programming the system. The processes here have many similarities between predictive modeling and data mining. This is because both the approaches and procedures involve identifying patterns in the data and adjusting and modifying the program according to that.
Machine learning engineers are often called sophisticated programmers who can develop and train machines in such a way that they understand and apply knowledge without any specific direction. Artificial intelligence is the goal of machine learning engineers but the focus of these computer programmers lies way beyond just designing specific programs for performing specific tasks.

Now that we have known what these two fields of data science and machine learning deal with, it becomes significant that we learn the difference between data science and machine learning as well to get a better idea.

Data Scientist against Machine Learning Engineer

There have been several data science jobs that have emerged and flooded the market in the recent years. Both data scientists and machine learning engineers are relatively new trajectories when it comes to a data science career. There are many parameters that can be taken into account while figuring out the difference between data science and machine learning.

1. Requirements for a data scientist:

Data scientist jobs require them to be highly educated. A master's degree or a PhD in data science is needed in order to qualify for a data scientist. Based on research conducted recently, data scientists are found to have an advanced degree in computer science, engineering, mathematics, statistics and such information technology related subjects. So, let's brief down the skills required.

1. A data scientist should at least have a Master's or PhD in computer science, engineering, mathematics or statistics in order to apply for data scientist jobs. Also, the programming languages such as R, Python, SQL and many such new technologies and trends that are in demand should be learnt by individuals in order to learn data science and thus get data science jobs. Now, all these programming languages can be learnt in a data scientist course which are very common nowadays.
2. Individuals should be adept in mathematics or should have very strong mathematical skills along with technical and analytical skills for becoming a data scientist.
3. Data mining and statistical techniques are the fields that one should gain experience in. Data mining techniques like boosting, generalized linear models or regression, network analysis are of vital importance when it comes to data scientist responsibilities as they have to deal with them.
4. Working with machine learning techniques such as the artificial neural network, clustering and such things helps you gain experience and thus works in your advantage when it comes to applying for data science jobs. An experience of at least 5 to 7 years in making statistical models and manipulating data sets is a vital requirement.
5. In order to learn data science, distributed data and computing tools such as Hadoop, Spark, MySQL, Python along with visualisation and presentation of data are required and for this a data science course is required. So, if you want to do a data science course then joining an institution would be advisable and Great Learning is a good institution for this.

2. Requirements for machine learning engineers:

Just like data scientists, most companies prefer machine learning engineers with a master's degree in any of the subjects related to technology. However, as this field is relatively a new field and thus there is a bit of shortage in people with these skills, the recruiters tend to be a bit more considerate while hiring candidates for data science jobs and often are willing to make exceptions. But this does not mean that the requirements are less when it comes to other parameters as the machine learning engineers should be familiar with some concepts like machine learning algorithms that can be learnt by

means of libraries, APIs, packages, etc. Along with this, some other skills that a machine learning engineer should have are as follows.

1. Experience with visual processing, deep neural network and reinforcement learning is a must. Also, having sufficient knowledge in programming languages like Python, Java, R, C++, C, JavaScript, Scala, etc. is required.
2. A strong grip in both probability and statistics is essential. Similarly, in mathematics, an in-depth knowledge is required as algorithm theories are required while deciphering complex machine learning algorithms in order to help the machines learn and communicate.
3. Advanced knowledge in engineering and strong analytical skills and experience using programming tools like MATLAB, working with distributed system tools like etcd, Zookeeper are also of vital importance. All these can be learned very easily by means of data science courses which are readily available both online and in institutes.
4. One should also be flexible and have no problem while dealing with a huge amount of data and working in a high throughput environment. Also, extensive knowledge of machine learning evaluation metrics are really important as skills.

3. Roles and Responsibilities of Data Scientists:

When compared with a statistician, a data scientist knows more programming as compared to them and when put against a software engineer, a data scientist knows more about statistics than them. The roles and responsibilities of a data scientist include storing and cleaning huge chunks of data, exploring data sets in order to identify patterns by looking into the valuable insights, running data science projects. The details of the data scientist responsibilities are as follows.

1. The very first of the roles and responsibilities of a data scientist involves researching and developing statistical models for data analysis which is an essential part to learn data science.
2. Understanding the needs of the customers and design models or lead them towards solutions comes under the major roles and responsibilities of a data scientist. Also, by collaborating with the management and engineering departments of the company, the data scientist might also understand the needs of the company or how to help the company progress with the help of data science.
3. Conveying the decisions, plans and concepts to the key business leaders comes under the roles and responsibilities of a data scientist. Identifying new opportunities or the recent trends in the industry and thus designing models keeping that in mind that will help in the improvement process of the company is also something that data scientists should be aware of and this is something which is often taught in a data scientist course.
4. Use of appropriate databases and project designs that are used to optimize the solutions that are being faced while being involved in a project is also one of the data scientist responsibilities. Also, the processing, cleansing and verifying the integrity of data to be used for data analysis also are important in

order to learn data science because these help in the future data science jobs.

4. Roles and Responsibilities of Machine Learning Engineers:
The responsibilities of a machine learning engineer will be related to the particular project that they are working on at one point of time. However, if you notice carefully, you will acknowledge that the machine learning engineers are responsible for creating algorithms often based on statistical modeling procedures. Now, let's see what exactly these machine learning engineers do on a daily basis.

1. The first task is to study and transform the data science technology prototypes and designing machine learning models. Also, collaborating with data engineers to develop data and model pipelines is also a part of what is thought of as one of the most acknowledged data science jobs.
2. In order to design distributed systems, the application of data science and machine learning techniques that are learnt while doing a data science course (preferably).
3. From writing production level codes to make that code suitable for production to getting involved in the code reviews and learning from them on what changes are to be made, the machine learning engineers put in great efforts to improve the existing machine learning models.
4. Selection of appropriate datasets and the proper data representation methods, running machine learning tests and doing experiments on them, performing statistical analysis and fine tuning using these test results are what make up for the roles and responsibilities of these machine learning engineers.

Conclusion

So, as can be seen, both data science and machine learning are outstanding career options and there are great opportunities in both of them. So, instead of finding out the difference between data science and machine learning and debating on which one is better, it will be beneficial to know and learn data science because if you learn data science, you will be able to master both of them and can have a career either as a data scientist or a machine learning engineer.

However, in order to learn data science, it is necessary to take a data science course and there are many data science courses available around. One institute that is known for its data scientist course or all the data science courses in general is Great Learning. The Great Learning data science courses have really proven to be of great help to the ones who took them when it came to their data science career. So, it is advisable to go for one of the Great Learning data science courses as those are outstanding because it is really necessary to have an in-depth knowledge of data science technology as well as have a hands-on experience in this field in order to have a data science career.