Expert Talk: Data Science vs. Data Analytics vs. Machine Learning

Srihari Sasikumar

Big Data And Analytics

Data science, analytics, and machine learning are growing at an astronomical rate and companies are now looking for professionals who can sift through the goldmine of data and help them drive swift business decisions efficiently. IBM predicts that by 2020, the number of jobs for all U.S. data professionals will increase by 364,000 openings to 2,720,000. We caught up with Eric Taylor, Senior Data Scientist at CircleUp in a Simplilearn Fireside Chat to find out what makes data science such an exciting field and what skills will help professionals gain a strong foothold in this fast-growing domain.

Watch the complete Fireside Chat recording here or read on to find out everything new and exciting about data science.

What Is Data Science?

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three, you are already highly knowledgeable in the field of data science.

Data science is a concept used to tackle big data and includes data cleansing, preparation, and analysis. A data scientist gathers data from multiple sources and applies machine learning, predictive analytics, and sentiment analysis to extract critical information from the collected data sets. They understand data from a business point of view and are able to provide accurate predictions and insights that can be used to power critical business decisions.

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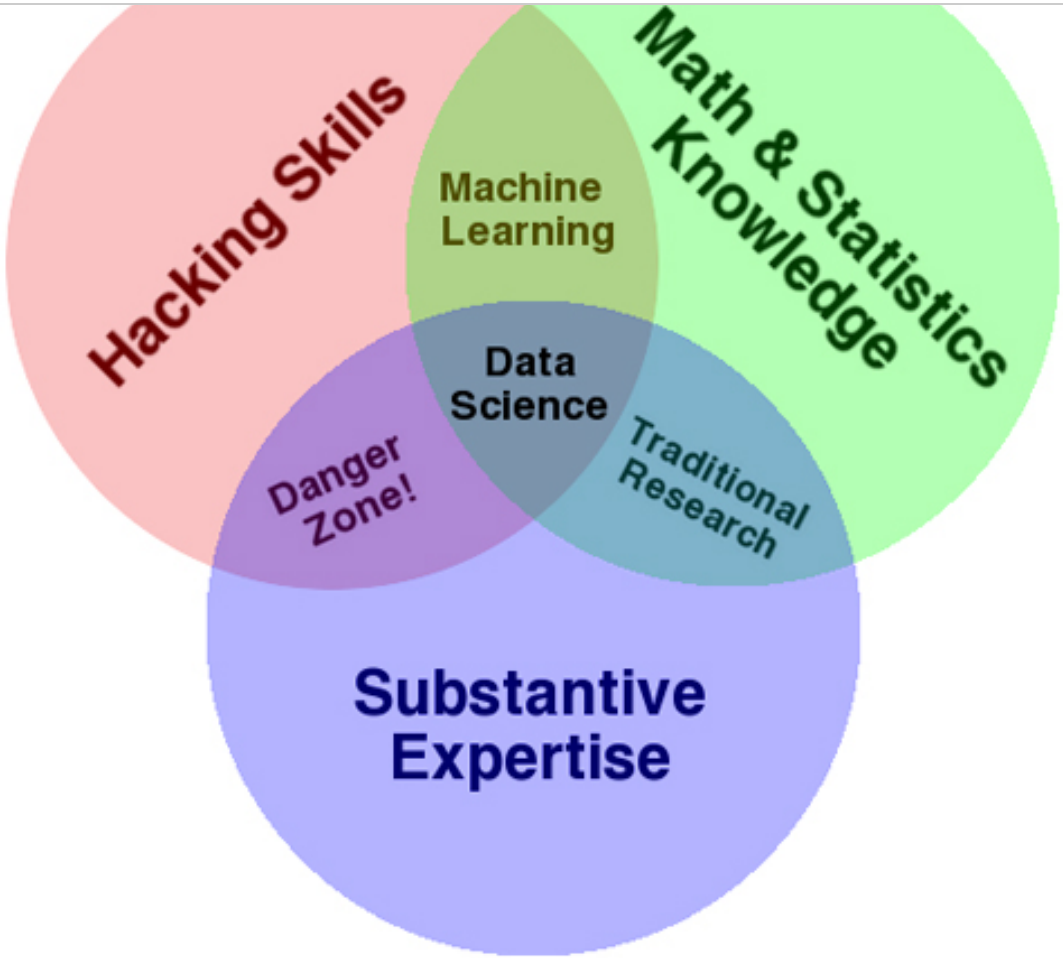

Venn Diagram
Source: Drewconway

What Skills Make a Data Scientist?

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- Strong knowledge of Python, SAS, R, Scala

- Ability to work with unstructured data from various sources like video and social media
- Understand multiple analytical functions
- Knowledge of machine learning

What Is a Data Analyst?

A data analyst is usually the person who can do basic descriptive statistics, visualize data and communicate data points for conclusions. They must have a basic understanding of statistics, a very good sense of databases, the ability to create new views, and the perception to visualize the data. Data analytics can be referred to as the basic level of data science.

What Are the Skills Required to Become a Data Analyst?

A data analyst should be able to take a specific question or a specific topic and discuss what the data looks like and represent that data to relevant stakeholders in the company. If you're looking to step into the role of a data analyst, you must gain these four key skills:

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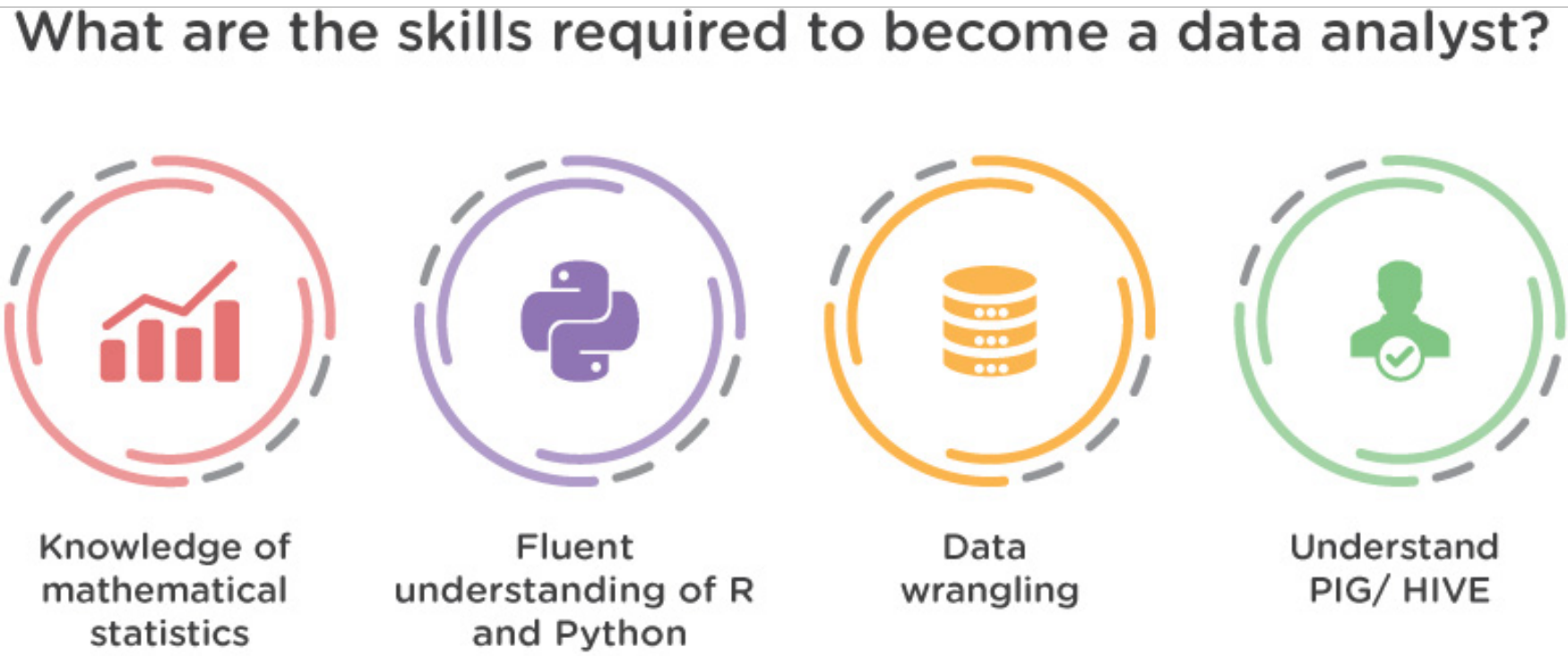

- Knowledge of mathematical statistics
- Fluent understanding of R and Python
- Data wrangling
- Understand PIG/ HIVE

Is There an Overlap Between Data Science and Data Analytics?

the existing set of questions.

What Is Machine Learning?

Machine learning can be defined as the practice of using algorithms to use data, learn from it and then forecast future trends for that topic. Traditional machine learning software comprised of statistical analysis and predictive analysis that are used to spot patterns and catch hidden insights based on perceived data. A good example of machine learning implementation is Facebook. Facebook's machine learning algorithms gather behavioral information for every user on the social platform. Based on one's past behavior, the algorithm predicts interests and recommends articles and notifications on the News Feed. Similarly, when Amazon recommends "You might also like" products, or when Netflix recommends a movie based on past behaviors, machine learning is at work.

What Are the Skills Required to Become a Machine Learning Expert?

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- Expertise in computer fundamentals
- In depth knowledge of programming skills
- Knowledge of probability and statistics
- Data modeling and evaluation skills

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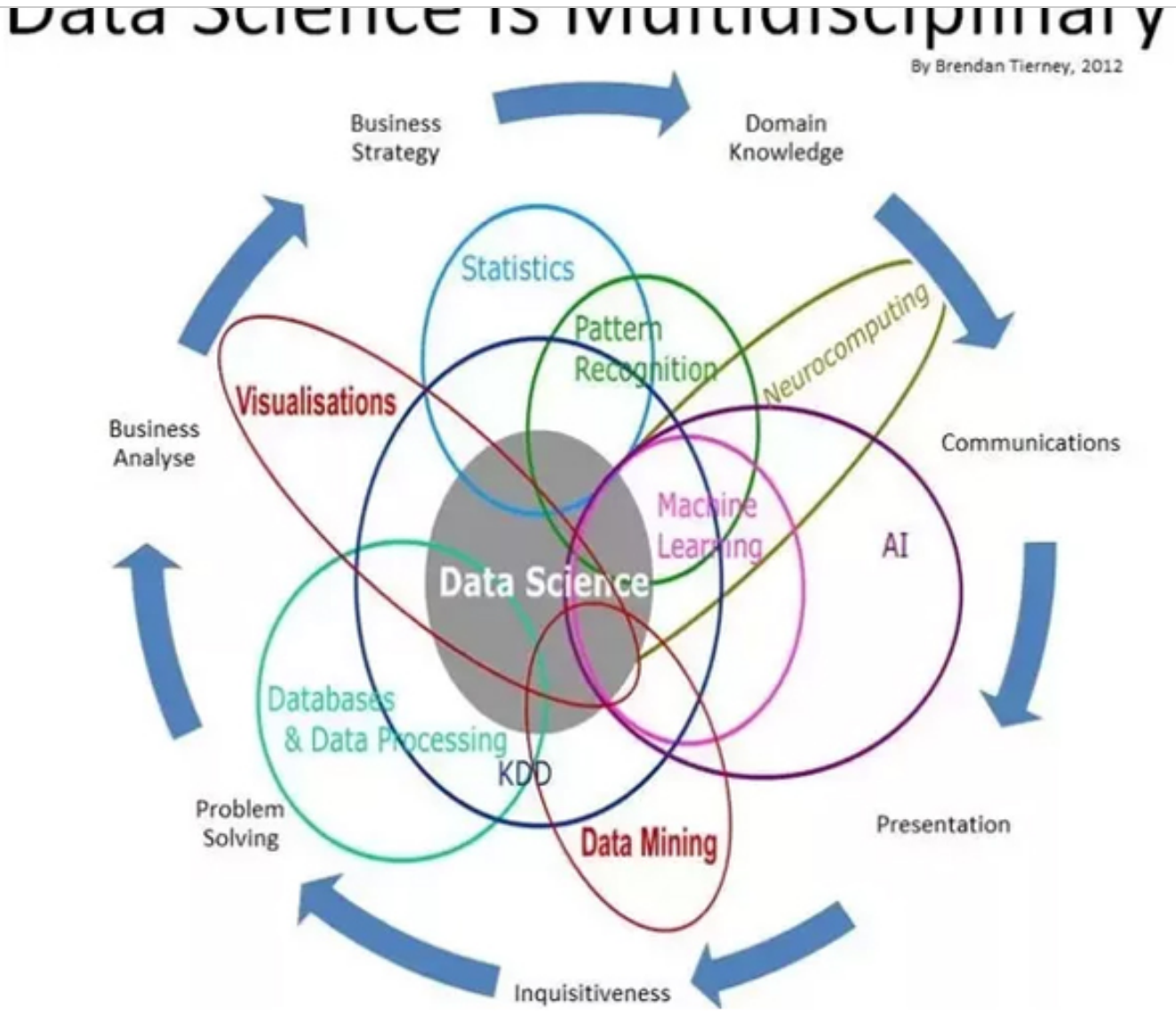
Is There an Overlap Between Machine Learning and Data Science?

Because data science is a broad term for multiple disciplines, machine learning fits within data science. Machine learning uses various techniques like regression and supervised clustering. On the other hand, 'data' in data science may or may not evolve from a machine or a mechanical process. So, the main difference between the two is that data science as a broader term not only focusses on algorithms and statistics but also takes care of the entire data processing methodology.



Source: Quora

responsible for bringing structure to big data, searching compelling patterns, and finally advising decision makers to bring in the changes effectively to suit the business needs. Data analytics and machine learning are two of the many tools and processes that data science uses.

Data science, data analytics, and machine learning are some of the most in-demand domains in the industry right now. A combination of the right skill sets and real-world experience can help you can secure a strong career in these trending domains.

Would you like to check the preview of our Machine Learning Course? Click here!

We hope this blog has helped you gain an understanding of data science and its connected fields. If you have more questions, please share them via the comments section below.

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About the Author

Srihari Sasikumar is a Product Manager with over six years of experience in various industries including Information Technology, E-Commerce, and E-Learning. Srihari follows the key trends in Big Data, Data Science, Programming & AI very closely.

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It would be helpful if you could explain What is Business Analytics exactly.

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Kishore D.S • 8 months ago

Thanks Sri Hari , it is a right menu which explains about Data science for a enthusiast like me

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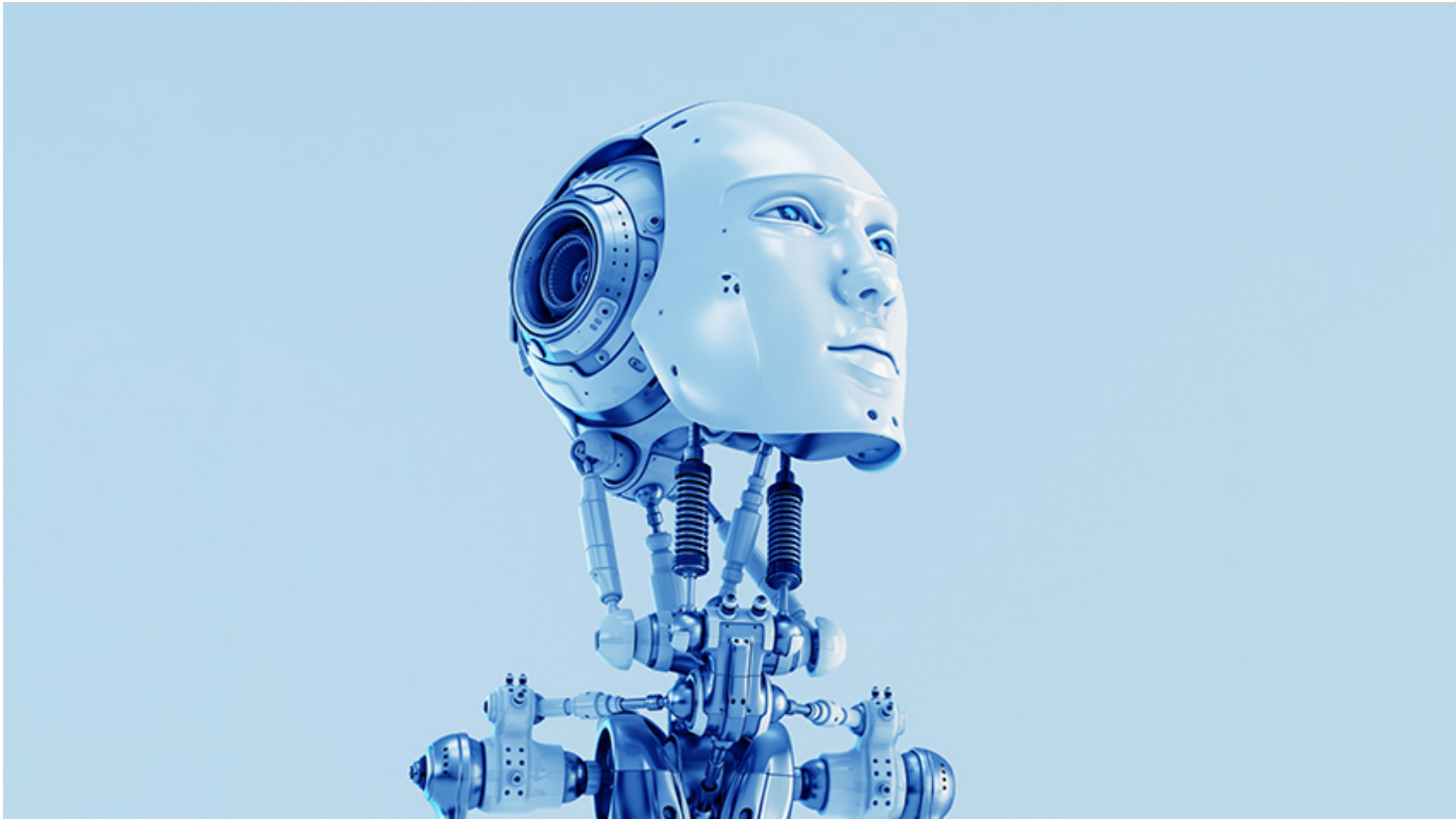

Jeevan Mathew Sajan

Published on Jan 24, 2018

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Artificial Intelligence (AI) is currently the hottest buzzword in tech. And with good reason—the last few years have seen a number of techniques that have previously been in the realm of science fiction slowly transform into reality. Experts look at artificial intelligence as a factor of production which has the potential to introduce new sources of growth and change the way work is done across industries. According to the report How AI Boosts Industry Profits and Innovations, AI is predicted to increase economic growth by an average of 1.7 percent across 16 industries by 2035. The report goes on to say that, by 2035, AI technologies could increase labor productivity by 40 percent or more, there by doubling economic growth in 12 developed nations that continue to draw talented and experienced professionals to work in this domain.

This article provides an overview on AI, its most popular industry applications, potential career paths and how a certification can help you jumpstart your career in this fast-growing domain.

What is Artificial Intelligence?

Artificial Intelligence is a method of making a computer, a computer-controlled robot or a software think intelligently in a manner similar to the human mind. AI is accomplished by studying the patterns of the human brain and by analyzing the cognitive process. The outcome of these studies develops intelligent softwares and systems. Researchers extend the goals of AI to the following:

1. **Logical Reasoning:** AI programs enable computers to perform sophisticated tasks. On February 10, 1996, a computer called Deep Blue, designed by IBM, won a game of chess against the former world champion, Garry Kasparov.

2. **Knowledge Representation:** Smalltalk is an object-oriented, dynamically typed, reflective programming language that was created as the language to underpin the “new world” of computing exemplified by “human-computer symbiosis.”

3. **Planning and Navigation:** The process enabling a computer to get from point A to point B. A prime example of this is Google’s self-driving Toyota Prius.

5. **Perception:** Use computers to interact with the world through sight, hearing, touch, and smell.

6. **Emergent Intelligence:** That is, intelligence that is not explicitly programmed, but emerges from the rest of the explicit AI features. The vision for this goal is to have machines exhibit emotional intelligence, moral reasoning and more.

Applications of Artificial Intelligence

Machines and computers affect the way we live and work. Top companies are constantly rolling out revolutionary changes to how we interact with machine-learning technology.

DeepMind Technologies, a British artificial intelligence company, was acquired by Google in 2014. The company created a Neural Turing Machine, allowing computers to mimic the short-term memory of the human brain.

Google's driverless cars and Tesla's Autopilot features are the introductions of AI into the automotive sector. Elon Musk, the founder, and CEO of Tesla Motors has suggested via Twitter that future Teslas will have the ability to predict the destination that their owners are wanting to go to via learning their pattern of behavior using AI.

Furthermore, Watson a question-answering computer system developed by IBM is designed for use in the medical field. Watson suggests various kinds of treatment for patients based on their medical history and has proven to be very effective.

Most people, however, utilize more common applications of AI, such as virtual personal assistants in our smartphones. Siri, Cortana, and Google Assistant are some very commonly used digital assistants that are found in iOS, Windows and Android phones. These applications collect information, interpret what is being asked and then supply the answer via fetched data and each one gradually improves based on user preferences.

Reasons to Gain Artificial Intelligence Certification

One in five companies will be using AI to make decisions in 2018. It will help companies offer customized solutions and instructions to employees in real-time. Therefore, a sharp increase in demand for professionals with skills in emerging technologies like AI will only grow.

2. New and Unconventional Career Paths
   AI is expected to create 2.3 million jobs by 2020 according to a recent report from Gartner. The Capgemini report found that 83 percent of companies using AI say that the technology is leading to the creation of new jobs. Because of AI, new skill sets are required in the workforce, leading to new job opportunities. Some of the top AI roles include:

   - AI/machine learning researcher: Research and identify improvements to machine learning algorithms.
   - AI software development, program management, and testing: Develop systems and infrastructure that can apply machine learning to an input data set.
   - Data mining and analysis: Investigate large data sources, often creating and training systems to recognize patterns.
   - Machine learning applications: Apply machine learning or AI framework to a specific problem in a different domain. For example, applying machine learning to gesture recognition, ad analysis or fraud detection.

3. Improve Your Earning Potential
   The average Artificial Intelligence engineer can earn $135,000 per year. According to an article in Fortune, many of the top tech enterprises are investing in hiring talent with AI knowledge. A certification in AI is a step in the right direction to enhance your earning potential and make you more marketable.

4. Higher Chances of an Interview
   If you are looking to penetrate the AI industry, a certification like Simplilearn's Artificial Intelligence Engineer will

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Artificial Intelligence is emerging as the next big thing in the technology field. Organizations are adopting AI and budgeting for certified professionals in the field, thus the demand for trained and certified professionals in AI is increasing. As this new field continues to grow, it will have an impact on everyday life and lead to considerable implications for many industries.

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About the Author

Jeevan is a content marketer with close to two years of experience in content writing and copy editing. He is a musician and a writer who enjoys playing around with words.

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Avantika Monnappa

Published on Apr 5, 2016

and changing the way we live. According to IBM, 2.5 billion gigabytes (GB) of data was generated every day in 2012.

An article by Forbes states that Data is growing faster than ever before and by the year 2020, about 1.7 megabytes of new information will be created every second for every human being on the planet.

Which makes it extremely important to at least know the basics of the field. After all, here is where our future lies.

In this article, we will differentiate between the Data Science, Big Data, and Data Analytics, based on what it is, where it is used, the skills you need to become a professional in the field, and the salary prospects in each field.

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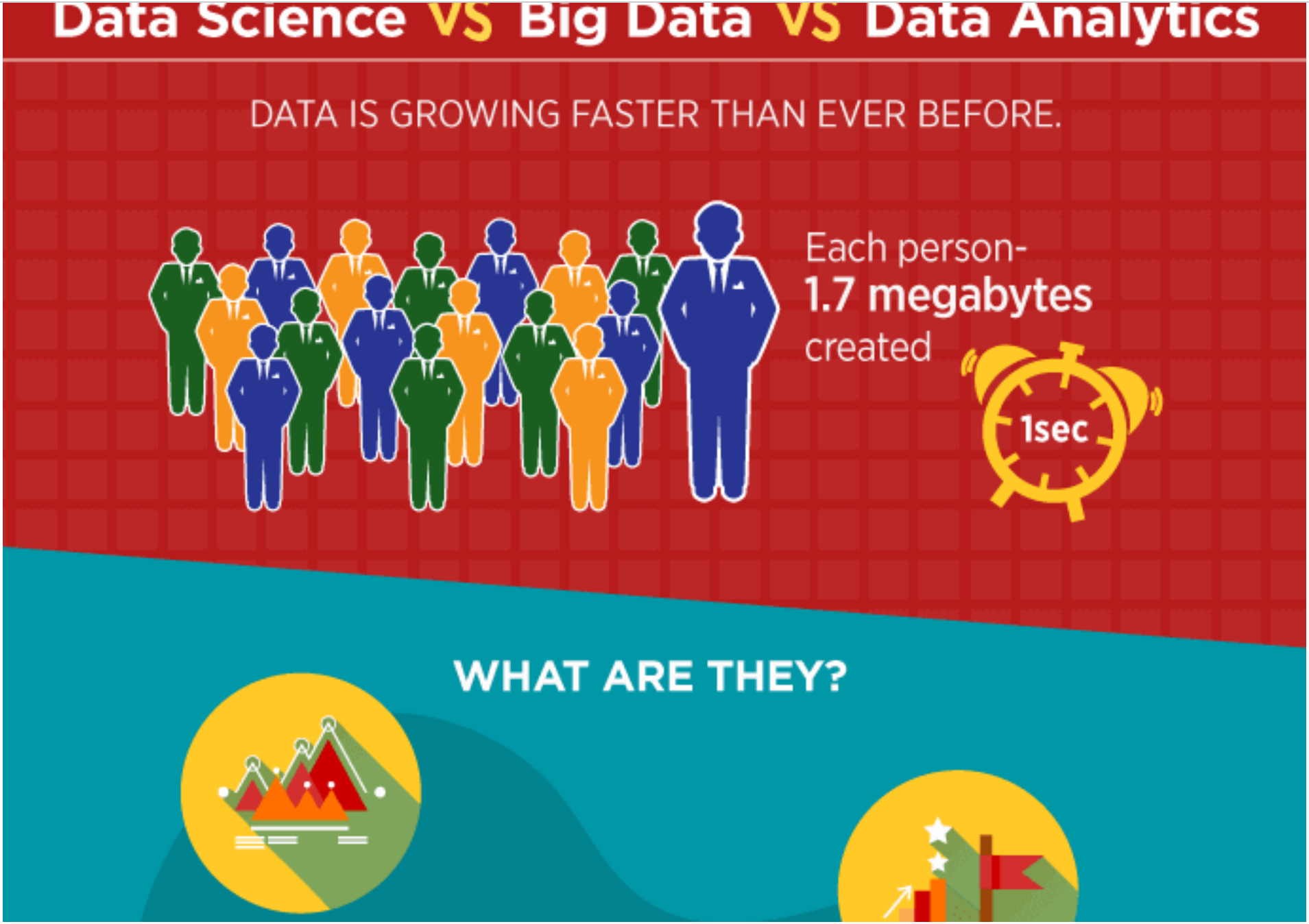

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preparation, and analysis.

Big Data is something that can be used to analyze insights which can lead to better decision and strategic business moves.

Data Analytics Involves automating insights into a certain dataset as well as supposes the usage of queries and data aggregation procedures.

WHERE ARE THEY USED?

Data Science algorithms are used in industries like:

Big Data is used in industries like:

Data Analytics is used in industries like:

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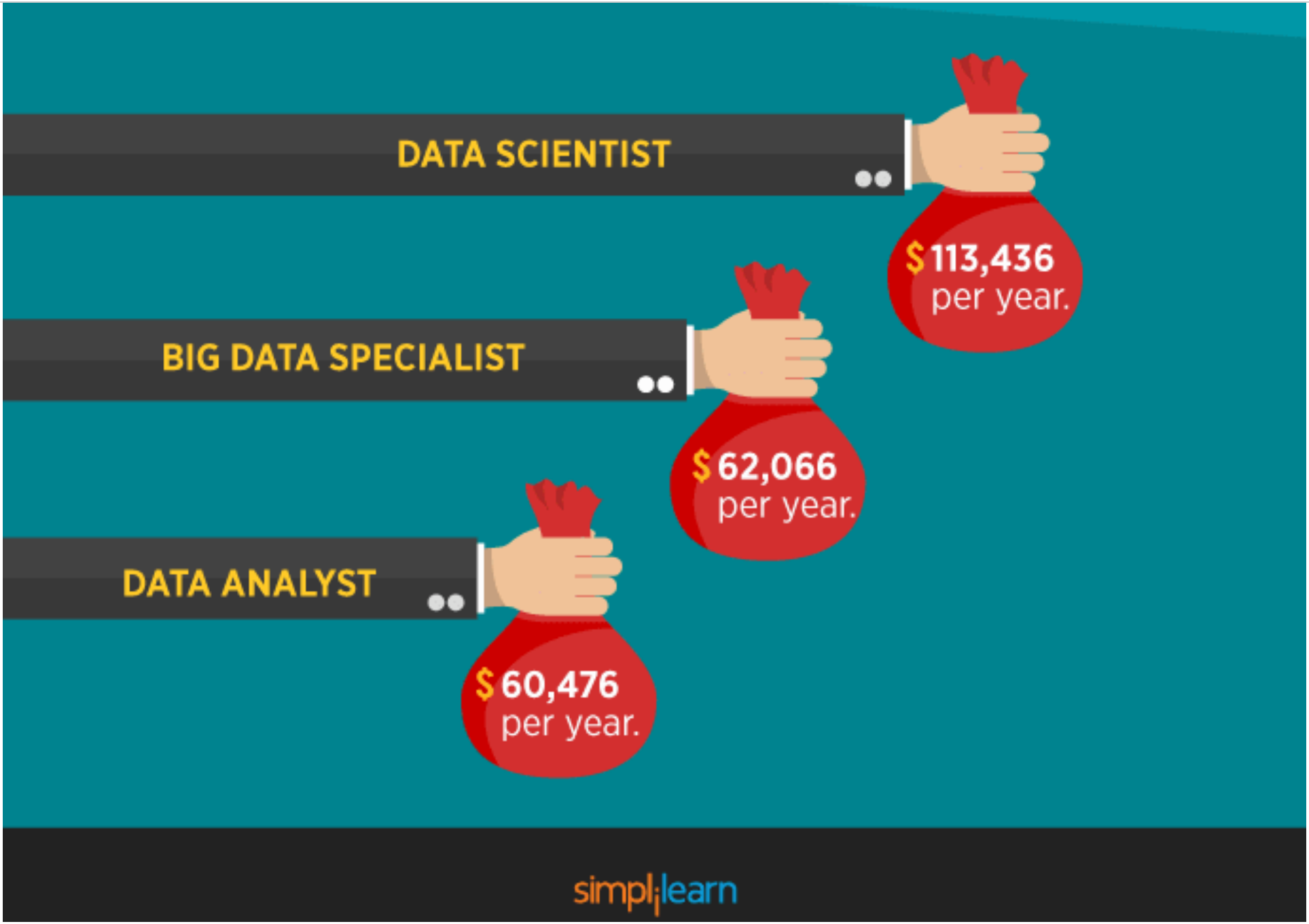

Let’s first start off with understanding what these concepts are.

What They Are

Data Science: Dealing with unstructured and structured data, Data Science is a field that comprises of everything that related to data cleansing, preparation, and analysis.

Data Science is the combination of statistics, mathematics, programming, problem-solving, capturing data in ingenious ways, the ability to look at things differently, and the activity of cleansing, preparing and aligning the data.

In simple terms, it is the umbrella of techniques used when trying to extract insights and information from data.

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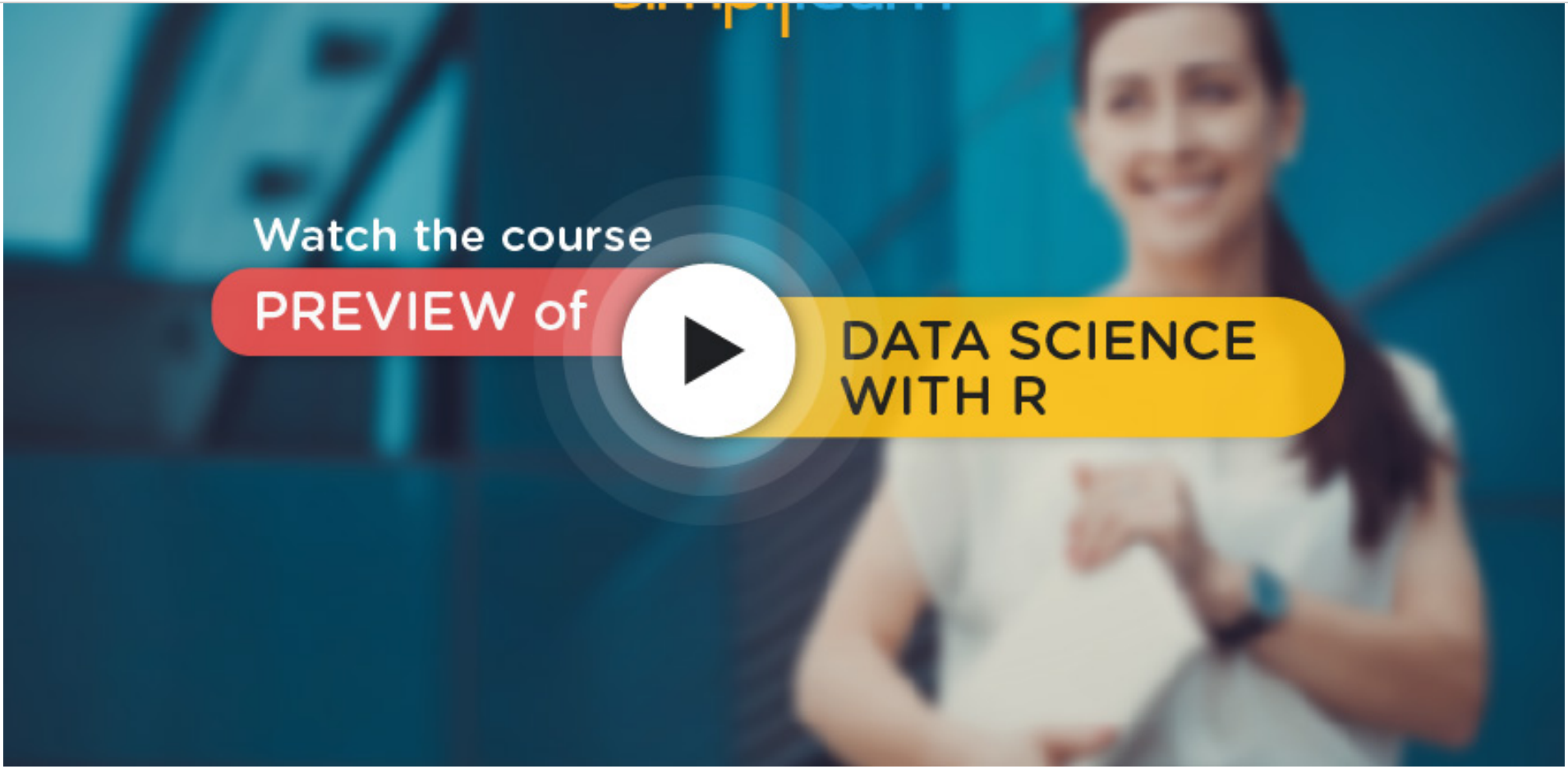

Big Data: Big Data refers to humongous volumes of data that cannot be processed effectively with the traditional applications that exist. The processing of Big Data begins with the raw data that isn't aggregated and is most often impossible to store in the memory of a single computer.

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The definition of Big Data, given by Gartner is, “Big data is high-volume, and high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation”.

Data Analytics: Data Analytics the science of examining raw data with the purpose of drawing conclusions about that information.

Data Analytics involves applying an algorithmic or mechanical process to derive insights. For example, running through a number of data sets to look for meaningful correlations between each other.

It is used in a number of industries to allow the organizations and companies to make better decisions as well as verify and disprove existing theories or models.

The focus of Data Analytics lies in inference, which is the process of deriving conclusions that are solely based on what the researcher already knows.

The Applications of Each Field

Applications of Data Science:

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- Digital Advertisements: The entire digital marketing spectrum uses the data science algorithms - from display banners to digital billboards. This is the mean reason for digital ads getting higher CTR than traditional advertisements.

- Recommender systems: The recommender systems not only make it easy to find relevant products from billions of products available but also adds a lot to user-experience. A lot of companies use this system to promote their products and suggestions in accordance with the user's demands and relevance of information. The recommendations are based on the user's previous search results.

Applications of Big Data:

- Big Data for financial services: Credit card companies, retail banks, private wealth management advisories, insurance firms, venture funds, and institutional investment banks use big data for their financial services. The common problem among them all is the massive amounts of multi-structured data living in multiple disparate systems which can be solved by big data. Thus big data is used in a number of ways like:

  - Customer analytics
  - Compliance analytics
  - Fraud analytics
  - Operational analytics

combine and analyze the masses of customer-generated data and machine-generated data that is being created every day.

- Big Data for Retail: Brick and Mortar or an online e-tailer, the answer to staying the game and being competitive is understanding the customer better to serve them. This requires the ability to analyze all the disparate data sources that companies deal with every day, including the weblogs, customer transaction data, social media, store-branded credit card data, and loyalty program data.

Applications of Data Analysis:

- Healthcare: The main challenge for hospitals with cost pressures tightens is to treat as many patients as they can efficiently, keeping in mind the improvement of the quality of care. Instrument and machine data is being used increasingly to track as well as optimize patient flow, treatment, and equipment used in the hospitals. It is estimated that there will be a 1% efficiency gain that could yield more than $63 billion in the global healthcare savings.

- Travel: Data analytics is able to optimize the buying experience through the mobile/ weblog and the social media data analysis. Travel sights can gain insights into the customer's desires and preferences. Products can be up-sold by correlating the current sales to the subsequent browsing increase browse-to-buy conversions via customized packages and offers. Personalized travel recommendations can also be delivered by data analytics based on social media data.

- Gaming: Data Analytics helps in collecting data to optimize and spend within as well as across games. Game companies gain insight into the dislikes, the relationships, and the likes of the users.

energy optimization, energy distribution, and building automation in utility companies. The application here is centered on the controlling and monitoring of network devices, dispatch crews, and manage service outages. Utilities are given the ability to integrate millions of data points in the network performance and lets the engineers use the analytics to monitor the network.

The Skills you Require

To become a Data Scientist:

- Education: 88% have a Master's Degree and 46% have PhDs
- In-depth knowledge of SAS and/or R: For Data Science, R is generally preferred.
- Python coding: Python is the most common coding language that is used in data science along with Java, Perl, C/C++.
- Hadoop platform: Although not always a requirement, knowing the Hadoop platform is still preferred for the field. Having a bit of experience in Hive or Pig is also a huge selling point.
- SQL database/coding: Though NoSQL and Hadoop have become a major part of the Data Science background, it is still preferred if you can write and execute complex queries in SQL.

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To become a Big Data professional:

- Analytical skills: The ability to be able to make sense of the piles of data that you get. With analytical abilities, you will be able to determine which data is relevant to your solution, more like problem-solving.

- Creativity: You need to have the ability to create new methods to gather, interpret, and analyze a data strategy. This is an extremely suitable skill to possess.

- Mathematics and statistical skills: Good, old-fashioned “number crunching”. This is extremely necessary, be it in data science, data analytics, or big data.

- Computer science: Computers are the workhorses behind every data strategy. Programmers will have a constant need to come up with algorithms to process data into insights.

- Business skills: Big Data professionals will need to have an understanding of the business objectives that are in place, as well as the underlying processes that drive the growth of the business as well as its profit.

To become a Data Analyst:

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- Statistical skills and mathematics: Descriptive and inferential statistics and experimental designs are a must for data scientists.

- Machine learning skills

- Data wrangling skills: The ability to map raw data and convert it into another format that allows for a more convenient consumption of the data.

- Communication and Data Visualization skills

- Data Intuition: it is extremely important for professional to be able to think like a data analyst.

Now let's talk about salaries!

Though in the same domain, each of these professionals, data scientists, big data specialists, and data analysts, earn varied salaries.

The average a data scientist earns today, according to Indeed.com is $123,000 a year. According to Glassdoor, the average salary for a Data Scientist is $113,436 per year.

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The average salary for a data analyst according to Glassdoor is $60,476 per year.

Now that you know the differences, which one do you think is most suited for you – Data Science? Big Data? Or Data Analytics?

You can check the Course Preview of our Data Science Training with R here.

Simplilearn has dozens of data science, big data, and data analytics courses online, including our Integrated Program in Big Data and Data Science. If you'd like to become an expert in Data Science or Big Data – check out our Masters Program certification training courses: the Data Scientist Masters Program and the Big Data Architect Masters Program.

Watch this video on Data Science vs Big Data vs Data Analytics

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