# Fundamentals of Computing for Data Science and Machine Learning

Computer Science is all about using softwares to build new and ideally better things that solve real-world problems.

If you are a data science or machine learning novice, you need to have good understanding of computer science and skills to grasp the concepts you want to learn for data science and machine learning.

I believe in learning by doing, and when you are learning all by yourself, you actually learn by building real projects.
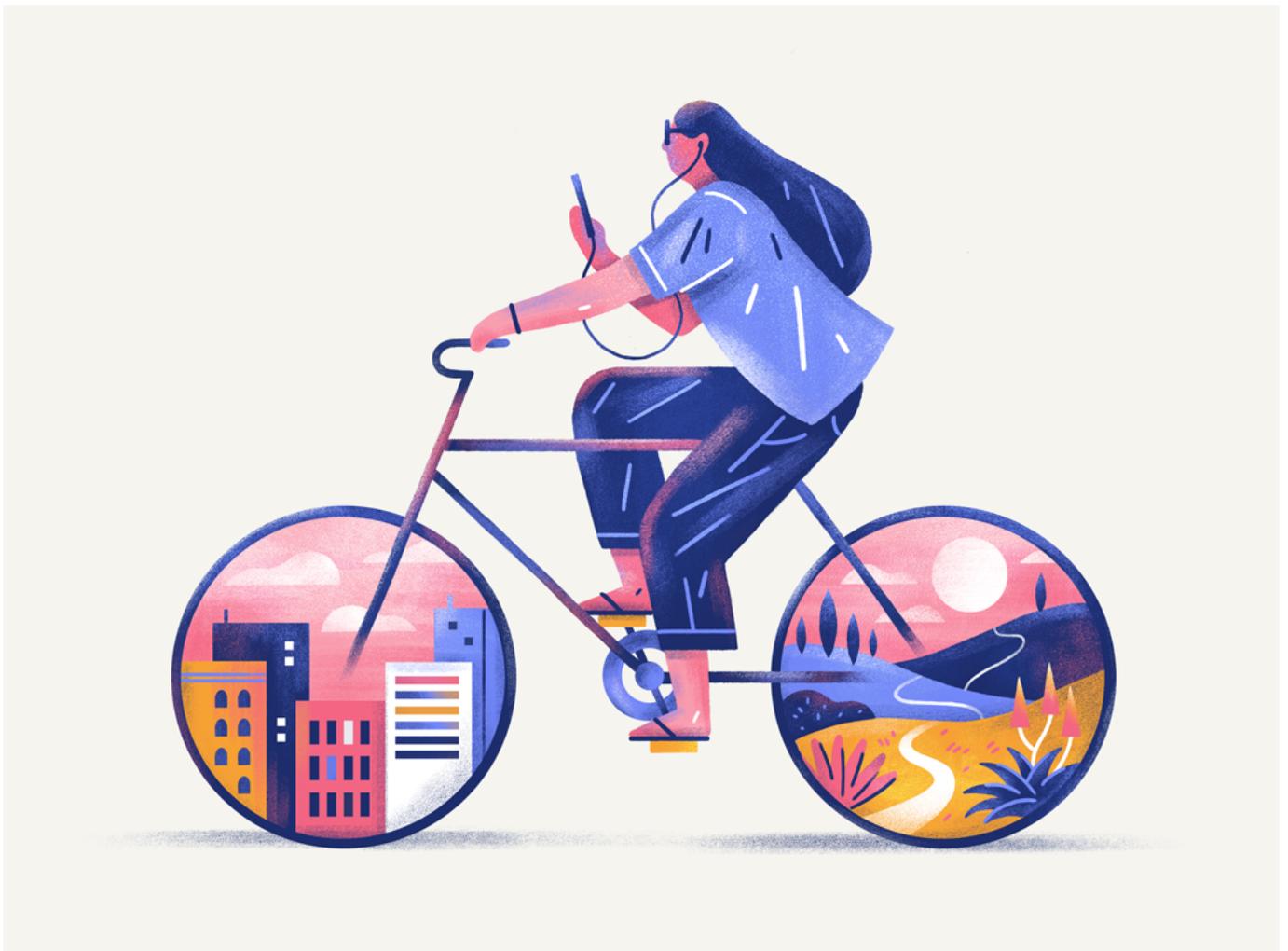
At this point, It's shouldn't concern you where your career ultimately takes you, if it has anything to do with the latest advancements in technology, you're simply going to need to know your Computer Science fundamentals, and through the learning resources in this article, you'll master those fundamentals.

Fundamentals of Computer Science for Data Science and Machine Learning

To gain a solid understanding and the breadth and scope of Computer Science, consider the following (two) specializations that can intellectually help you to wrap your mind around the computational thinking, ranging from everyday tasks to algorithms.

— Fundamentals of Computing Specialization

This interactive specialization for beginners is designed by Rice University and delivered via Coursera.

This specialization sequence is comprised of four courses and covers much of the material that fresh-man level computer science students take to learn programming and begin to think like a Computer Scientist.

You will learn sophisticated skills in Python programming from the ground up and solidify your skills through hands-on exercises and building 20 fun projects.

First, You will start with the basics of building simple interactive applications in Python and gain familiarity with expressions, conditionals, and functions.

Next, You will dig deeper to learn Interactive programming in Python by applying the skills you learners in previous course by creating a simple interactive applications such as a digital stopwatch and an arcade game.

Finally, The last two courses will focus on building upon the Python programming skills that you learned in first two courses. This will module will help you to gain life long skills in coding standards and testing.

You will also learn about probability, combinatorics and counting with focus towards practical applications of the key concepts in Computer Science.

Furthermore, You will finish with a Capstone exam that allows you to demonstrate and validate the range of knowledge you have acquired in this Specialization.

Is it right you for you?

This specialization is suitable for learners with no prior experience or knowledge of Computer Science and Programming.

By the end, you will have gained skills and knowledge in Recursion, Learn Algorithms, Python for Data Science and Dynamic Programming.

You will also become highly prepared for advanced courses in data science and machine learning.

GO TO SPECIALIZATION

— Accelerated Computer Science Fundamentals Specialization

This specialization is offered by University of Illinois at Urban-Champaign and delivered via Coursera.

This specialization sequence is designed to help prospective applicants to become prepared and enrol for Master of Computer Science (MCS) and Masters of Computer Science in Data Science (MSC-DS).

First, You will learn to design and implement an object-oriented program in the C++ language and gain the skills you need for defining classes that encapsulate data structures and algorithms.

Next, You will dig a little deeper in learning about the ordered Data Structures. You

will also learn how to Select and implement appropriate data structures that best utilize resources to solve a computational problem.

Afterwards, You will gain some important skills to Analyze the running time and space needs of an algorithm, asymptotically to ensure it is appropriate at scale, including for big data.

Most importantly, You will learn about the data structures and algorithms needed to implement hash tables, graphs and disjoint sets.

Is it right for you?

This course is suitable for learners who have a basic familiarity with Python programming.

By the end, You will have gained skills and knowledge to work with Run-time Analysis, Algorithms, Hash Table, Tree (Data Structures), Object-Oriented Programming (OPP).

You will also become highly prepared for advanced courses in data science and machine learning with foundational knowledge of object data structures you need to implement and call advanced library functions.

GO TO SPECIALIZATION

Alternative Computer Science Classes

While I can't audit all the Computer Science classes, Here are a couple additional ones worth a mention.

— Introduction to Computer Science and Programming Specialization

This specialization sequence is deigned for beginners by University of London and delivered via Coursera.

— Computer Science and Programming Fundamentals

This course is offered by Sanjay Sathe and delivered via Udemy.

Thanks for making it to the end ;)

If you liked this article. I've got a few practical reads for you. One about Best Data Science Courses and One about Machine Learning Courses from World-Class Educators.

I've also got this [data science and ai newsletter](#) that you might be into. I send a tiny email once every fortnight with some useful and cool stuff I've found/made.

Don't worry, I hate spam as much as you. ✍

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