

Data Structure Algorithmic Thinking Python

Parallel algorithm

searching for a target element in a data structure and the evaluation of an algebraic expression. Parallel algorithms on individual devices have become

In computer science, a parallel algorithm, as opposed to a traditional serial algorithm, is an algorithm which can do multiple operations in a given time. It has been a tradition of computer science to describe serial algorithms in abstract machine models, often the one known as random-access machine. Similarly, many computer science researchers have used a so-called parallel random-access machine (PRAM) as a parallel abstract machine (shared-memory).

Many parallel algorithms are executed concurrently – though in general concurrent algorithms are a distinct concept – and thus these concepts are often conflated, with which aspect of an algorithm is parallel and which is concurrent not being clearly distinguished. Further, non-parallel, non-concurrent algorithms are often referred to as "sequential..."

Data, context and interaction

(relatively) static data model with relations. The data design is usually coded up as conventional classes that represent the basic domain structure of the system

Data, context, and interaction (DCI) is a paradigm used in computer software to program systems of communicating objects. Its goals are:

To improve the readability of object-oriented code by giving system behavior first-class status;

To cleanly separate code for rapidly changing system behavior (what a system does) versus slowly changing domain knowledge (what a system is), instead of combining

both in one class interface;

To help software developers reason about system-level state and behavior instead of only object state and behavior;

To support an object style of thinking that is close to programmers' mental models, rather than the class style of thinking that overshadowed object thinking early in the history of object-oriented programming languages.

The paradigm separates the domain model...

Data science

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Data science is an interdisciplinary academic field that uses statistics, scientific computing, scientific methods, processing, scientific visualization, algorithms and systems to extract or extrapolate knowledge from potentially noisy, structured, or

unstructured data.

Data science also integrates domain knowledge from the underlying application domain (e.g., natural sciences, information technology, and medicine). Data science is multifaceted and can be described as a science, a research paradigm, a research method, a discipline, a workflow, and a profession.

Data science is "a concept to unify statistics, data analysis, informatics, and their related methods" to "understand and analyze actual phenomena" with data. It uses techniques and theories drawn from many fields within the context...

Skeleton (computer programming)

errors below. Python has a similar approach to document its in-built methods, however mimics the language's lack of fixation on scope and data types. This

Skeleton programming is a style of computer programming based on simple high-level program structures and so called dummy code. Program skeletons resemble pseudocode, but allow parsing, compilation and testing of the code. Dummy code is

inserted in a program skeleton to simulate processing and avoid compilation error messages. It may involve empty function declarations, or functions that return a correct result only for a simple test case where the expected response of the code is known.

Skeleton programming facilitates a top-down design approach, where a partially functional system with complete high-level structures is designed and coded, and this system is then progressively expanded to fulfill the requirements of the project. Program skeletons are also sometimes used for high-level descriptions...

Recursion (computer science)

(2010), Python Algorithms: Mastering Basic Algorithms in the Python Language, Apress, p. 79, ISBN 9781430232384. Drozdek, Adam (2012), Data Structures and

In computer science, recursion is a method of solving a computational problem where the solution depends on solutions to smaller instances of the same problem. Recursion solves such recursive problems by using functions that call themselves from within their own code. The approach can be applied to many types of problems, and

recursion is one of the central ideas of computer science.

The power of recursion evidently lies in the possibility of defining an infinite set of objects by a finite statement. In the same manner, an infinite number of computations can be described by a finite recursive program, even if this program contains no explicit repetitions.

Most computer programming languages support recursion by allowing a function to call itself from within its own code. Some functional programming...

Analysis of parallel algorithms

(2009). Thinking in Parallel: Some Basic Data-Parallel Algorithms and Techniques, 104 pages (PDF). Class notes of courses on parallel algorithms taught

In computer science, analysis of parallel algorithms is the process of finding the computational complexity of algorithms executed in parallel – the amount of time, storage, or other resources needed to execute them. In many respects, analysis of parallel algorithms is similar to the analysis of sequential algorithms, but is generally

more involved because one must reason about the behavior of multiple cooperating threads of execution. One of the primary goals of parallel analysis is to understand how a parallel algorithm's use of resources (speed, space, etc.) changes as the number of processors is changed.

List of computer books

Martelli — Python in a Nutshell and Python Cookbook *Mark Pilgrim – Dive into Python*
Naomi Ceder — The Quick Python Book *Wes McKinney — Python for Data Analysis*

List of computer-related books which have articles on Wikipedia for themselves or their writers.

Data and information visualization

such as D3, Python (through matplotlib, seaborn) and JavaScript and Java(through JavaFX) help to make the visualization of quantitative data a possibility

Data and information visualization (data viz/vis or info viz/vis) is the practice of

designing and creating graphic or visual representations of quantitative and qualitative data and information with the help of static, dynamic or interactive visual items. These visualizations are intended to help a target audience visually explore and discover, quickly understand, interpret and gain important insights into otherwise difficult-to-identify structures, relationships, correlations, local and global patterns, trends, variations, constancy, clusters, outliers and unusual groupings within data. When intended for the public to convey a concise version of information in an engaging manner, it is typically called infographics.

Data visualization is concerned with presenting sets of primarily quantitative...

Computing in Science & Engineering

include "Python for Scientific Computing" by Travis Oliphant, which has more than 15 thousand views in Xplore, and "The NumPy Array: A Structure for Efficient

Computing in Science & Engineering (CiSE) is a bimonthly technical magazine published by the IEEE Computer Society. It was founded in 1999 from the merger of

two publications: Computational Science & Engineering (CS&E) and Computers in Physics (CIP), the first published by IEEE and the second by the American Institute of Physics (AIP). The founding editor-in-chief was George Cybenko, known for proving one of the first versions of the universal approximation theorem of neural networks.

The magazine is interdisciplinary and covers topics such as numerical simulation, modeling, and data analysis and visualization. CiSE aims to provide its readers with practical information on the latest developments in computational methods and their applications in science and engineering. Computing in Science...

Head/tail breaks

Head/tail breaks is a clustering algorithm for data with a heavy-tailed distribution such as power laws and lognormal distributions. The heavy-tailed distribution

Head/tail breaks is a clustering algorithm for data with a heavy-tailed distribution such as power laws and lognormal distributions. The heavy-tailed distribution can be simply referred to the scaling pattern of far more small things than large ones, or alternatively numerous smallest, a very few largest, and some in between the smallest

and largest. The classification is done through dividing things into large (or called the head) and small (or called the tail) things around the arithmetic mean or average, and then recursively going on for the division process for the large things or the head until the notion of far more small things than large ones is no longer valid, or with more or less similar things left only. Head/tail breaks is not just for classification, but also for visualization...

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