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COMPARATIVE ANALYSIS OF THE PERFORMANCE OF NEURAL NETWORKS IN C++ AND PYTHON PROGRAMMING LANGUAGES

Neural networks are complex mathematical models used to solve various problems in different fields such as machine learning, natural language processing, intelligent data analysis, and others. Different programming languages are used to implement neural networks, but the most popular ones are C++ and Python.

It should be noted that the performance of neural networks depends not only on the programming language but also on hardware resources, algorithms, optimization methods, and data volume. However, the choice of programming language has a significant impact on the performance of the neural network, development efficiency, and training.

Comparing the performance of neural networks in C++ and Python programming languages depends on many factors, such as the size and complexity of the network, the size of the data processed by the network, as well as code optimization.

C++ is a low-level programming language that allows for optimizing code for memory and computation. It is considered faster and more efficient for computations involving neural networks.

However, Python is a simple and convenient programming language for developing and debugging neural networks, which often leads to faster development and debugging of software.

The memory consumption evaluation when executing neural networks on C++ and Python depends on several factors, such as the network architecture, the size of the data processed by the network, the data types used, and the optimization method and framework being used. C++ provides more control over memory and program execution. Therefore, it results in lower memory consumption compared to executing on Python. However, most neural network frameworks, such as TensorFlow and PyTorch, provide implementations on both languages, so the language choice depends on the specific needs and requirements of the project.

There are also several libraries for neural programming in C++. However, their number and functionality are not as extensive as those available in Python. Some of these include Caffe2, TensorFlow C++ API, Torch C++ API, DeepDetect, OpenCV.

C++ is a faster programming language compared to Python since it compiles to machine code. This is especially important for implementing complex algorithms that require a large number of floating-point operations. Python is a language with a higher level of abstraction, which allows reducing the amount of code, which is important when writing a neural network.

Python is a highly popular programming language in the field of machine learning and neural networks, thanks to its simplicity, wide selection of libraries and frameworks, and ease of data visualization and analysis.

However, if program execution speed is a critical factor, for example, if there is a need to process large volumes of data in real-time mode and if the project implies writing complex code that requires highly efficient memory usage, C++ may be a better choice.