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A STUDY OF PYTHON-TO-OPEN CL: A FRAMEWORK FOR COMPOSING HIGH-PERFORMANCE GPU ACCELERATION

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ABSTRACT

The utilization of Graphics Processing Units (GPUs) for accelerating computationally intensive tasks has become increasingly popular in various fields, from scientific computing to machine learning. Python, with its simplicity and extensive libraries, is a preferred choice for many developers. However, harnessing the full potential of GPUs within Python has historically been challenging due to the Global Interpreter Lock (GIL) and the complexity of low-level GPU programming. This research study introduces Python-to-OpenCL, a novel framework that bridges the gap between Python and GPU acceleration by enabling developers to compose high-performance GPU-accelerated code with ease. Python-to-OpenCL leverages the power of OpenCL, a cross-platform open standard for parallel computing on heterogeneous systems. The framework facilitates the seamless integration of Python code with OpenCL kernels, allowing for efficient GPU acceleration without sacrificing the advantages of Python's high-level programming.