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**A STUDY OF ENABLING HIGH-PERFORMANCE OPEN CL CODE
GENERATION FROM PYTHON DESCRIPTIONS**

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ABSTRACT

OpenCL (Open Computing Language) has gained popularity as a versatile framework for programming heterogeneous computing platforms, including CPUs, GPUs, and FPGAs. Python, on the other hand, is widely recognized for its ease of use and readability, making it a preferred choice for developers. This research study explores the development of a novel approach to enable high-performance OpenCL code generation directly from Python descriptions. The proposed method leverages Python's expressive syntax and high-level abstractions to facilitate the seamless translation of algorithmic descriptions into efficient OpenCL code, ultimately bridging the gap between ease of development and computational performance. OpenCL has become a pivotal framework for harnessing the computational power of heterogeneous hardware. Its ability to target a wide range of devices, from traditional CPUs to specialized GPUs and FPGAs, has made it indispensable in various domains, including scientific computing, machine learning, and real-time graphics. Python, on the other hand, is a popular and versatile programming language known for its simplicity, readability, and a vast ecosystem of libraries.