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*Geometric Algebra Computing for a Wide Range of Computing Devices*

**Abstract**

Geometric Algebra is a powerful mathematical tool for a wide range of engineering applications, and engineering applications are using a wide range of computing devices such as CPU, GPU, DSP, FPGA. This talk answers the question on how all these devices are able to benefit from the properties of Geometric Algebra Computing such as geometrical intuitiveness, high runtime performance and robustness. The goal of the software package GAALOP is to support as many computing devices as possible. Its main concept is to translate Geometric Algebra algorithms first into an optimized intermediate representation and, in a second step, to derive implementations for a wide range of sequential and parallel computing architectures. We present, for instance, a general solution for all the heterogeneous computing architectures of the HSA Foundation (founded by the processor companies AMD ARM, Imagination Technologies, MediaTek, Qualcomm, Samsung and Texas Instruments) and a simple proof-of-concept ray tracing application. Another recent development, that we will present, is a new, very flexible, co-processor design based on GAALOP called GAPPCO.