Samara Technology Group Plug In Mathematical Libraries

Executive Summary

Mathematical libraries are at the heart of many applications. Samara's faster plug in libraries let you optimize your system with zero engineering effort. You can use them to speed up existing binary executables – your own or critical 3rd party software – simply by installing. Or build them right into your application.

Whether it's calculating simple rounding or complex transcendentals, most program rely on floating point mathematical libraries. Simple scalar arithmetical operations like add or multiply are built into most of today's processor architectures and so execute with limited latency. But other scalar operations like "nearest integer"or "cosine" are much more expensive to calculate, requiring latencies of up to a thousand times the simplest cases.

Furthermore, when even simple operations are put into a loop, latencies add up rapidly and degrade performance. Modern compilers and "vector units" like Intel's SSE have gotten cleverer at increasing throughput, but even the best compiler usually produces results that are far from theoretical best performance.

Most libraries provide functions that are very accurate and standards compliant. Such implementations are often less than optimal since they are conceived as cross-platform solutions. Further most elementary function algorithms use an iterative approach that can cause vast variations in execution time depending on input data.

Samara's mathematical libraries are designed to take advantage of platform-specific architectural features. That means faster execution times and lower latencies. Our algorithms allow us to guarantee the fastest times over each part of the functional domain, without performance cold spots. Our vector functions, which replace common loops, minimize latency and maximize throughput to near theoretical limits.

Samara's libraries can be made available to virtually all applications running on your platform, whether they've been built with them or not. That means that you can speed up even ISV applications simply by including our libraries in your environment. And they can be custom sized so that you can have just as many, or as few functions as you need.

Only the Samara Technology Group can deliver high performance and high accuracy mathematical libraries for the full breadth of today's Linux computing world: from small mobile platforms like MIPS, Atom and ARM to the worlds largest cluster platforms like Nehalem, Power and PPC.

Selected Scalar (intrinsic) Components

- **Single and Double Precision Floating Point:**
  atan, atan2, ceil, exp, floor, fmax, fmin, hypot, log, log10, log2, rint round, sin, cos, sincos, tan, trunc.

Selected Vector Library Components

- ***Single, Double Floating Point and Complex:* full monadic, dyadic and triadic support including signal processing and elementary functions.**

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