

Fast and Errorless Chips

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Exact Computing: Errorless and Faster

SciSci Research is an accelerated computing chip design company building the world's first fast and errorless AI accelerator chip, the exact processing unit (EPU). SciSci is building the EPU to efficiently perform exact arithmetic without rounding error, thanks to a novel alternative number representation and logic design that offers a major improvement over floating-point arithmetic.

Accelerated computing companies such as NVIDIA are increasingly offering lower-precision compute in an attempt to scale AI, which they must do because of the precision/speed tradeoff from which floating-point suffers. SciSci's mission is to end the tradeoff between speed and precision once and for all, and to outperform GPUs/TPUs in the AI compute market, by offering fast and scalable compute at perfect precision.

Performance Advantages

- *Errorless Compute:* **Perfect precision** within a large range (e.g., 64 or 128 bits), saving $\sim 10\%$ precision per operation compared to 8-bit floating-point and $\sim 100\%$ precision compared to 4-bit
- *Fast Compute:* $\sim 1500\%$ speed gain *per operation per ALU*, scaling massively for a highly multi-core EPU. This efficiency owes to a simpler architecture for arithmetic operations, as well as novel parallelization unlocks.
- *Ease of Manufacturing and Use:* The EPU architecture doesn't require new hardware or newfangled memory/data designs, shrinking the timelines for manufacturing and software development. The novel number representation gets abstracted away in software, so users don't need to know it to use it, just like developers don't need to understand binary to write code.