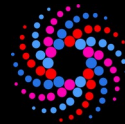
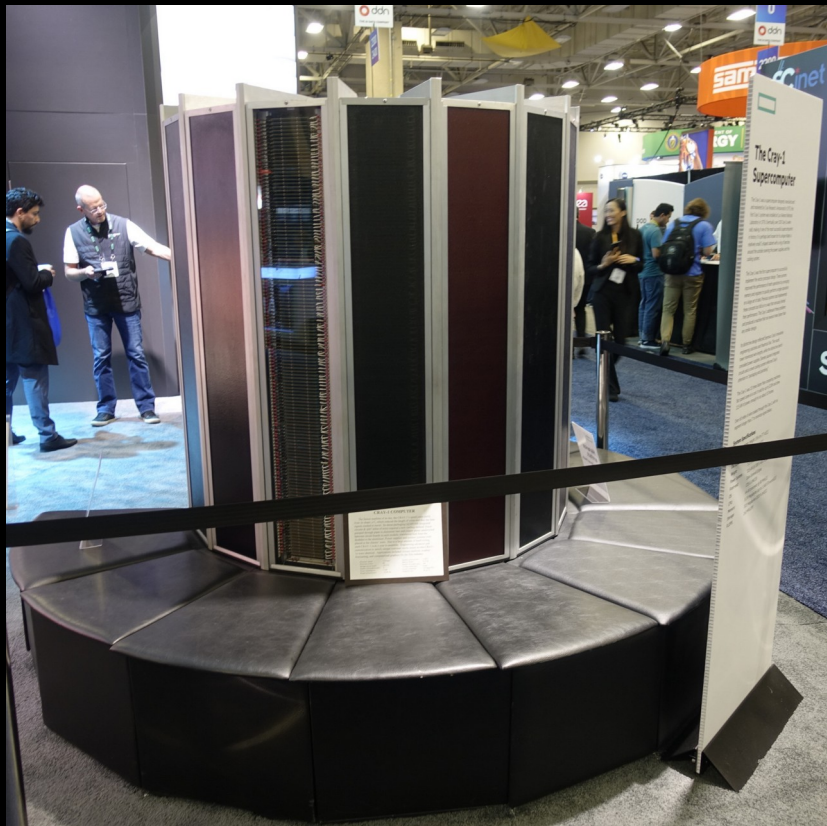


Cool Stuff @



SC22

Dallas, TX | hpc accelerates.



Cerebras CS-2 Engine Block

- 100,000 cores
- 46,225 mm² silicon
- 2.6 Trillion transistors
- 40 Gigabytes of on-chip memory
- 220 Pbit/s fabric bandwidth
- 7nm process technology



Cerebras Wafer-Scale Engine


The heart of the CS-2 system is the Wafer-Scale Engine, the WSE.

Specifications

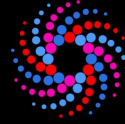
- 100,000 cores optimized for sparse linear algebra
- 46,225 mm² silicon
- 2.6 Trillion transistors
- 40 Gigabytes of on-chip memory
- 220 Pbit/s memory bandwidth
- 220 Pbit/s fabric bandwidth
- 7nm process technology

Architected specifically to efficiently perform the mathematics that underpins neural networks, the WSE is the world's largest microchip and the world's most powerful AI accelerator.

The whole of the rest of the system is dedicated to the care and feeding of the WSE.



Cool Stuff @

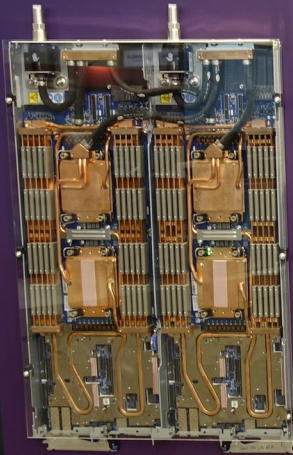


SC22

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SD650 V3

Accelerated with 4th Gen Intel[®] Xeon[®] Scalable Processors



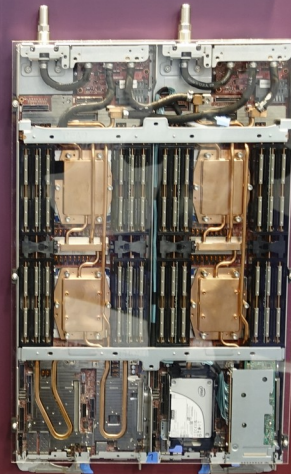
SD650-I V3

Intel[®] Data Center GPU Max Series



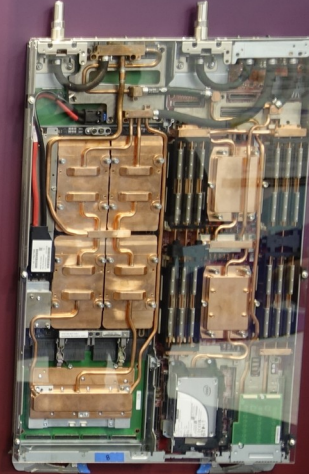
SD665 V3

4th Gen AMD EPYC[™] Processors

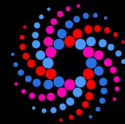


SD665-N V3

Neptune powered by NVIDIA H100

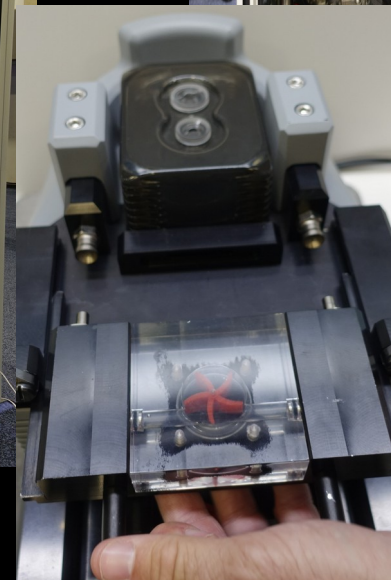


Cooling Stuff @



SC22

Dallas, TX | hpc accelerates.

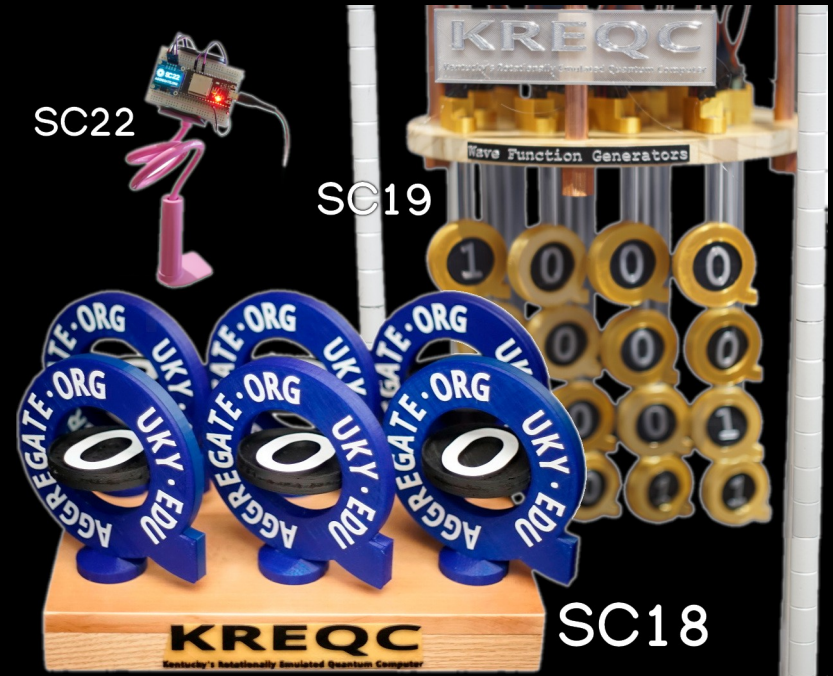


Parallel Bit Pattern (PBP) Computing

A new, quantum-inspired, model for parallel computation:

- An alternative to quantum*
- Efficient bit-serial SIMD*

The potential to reduce power per computation by orders of magnitude without exotic hardware

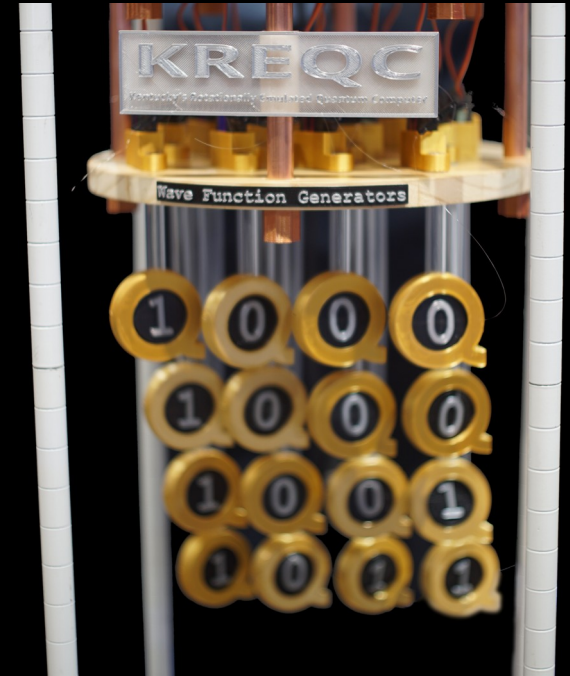


Array-of-Bits Representation

E-way entangled superposition uses 2^E bits:

	0	1	2	3		3	1	3	0		3	2	5	3
	0	1	0	1	+	1	1	1	0	=	1	0	1	1
	0	0	1	1		1	0	1	0		1	1	0	1
											0	0	1	0

- *2-way result is 25% 2, 50% 3, and 25% 5*
- *AoB bit patterns have very low entropy...*

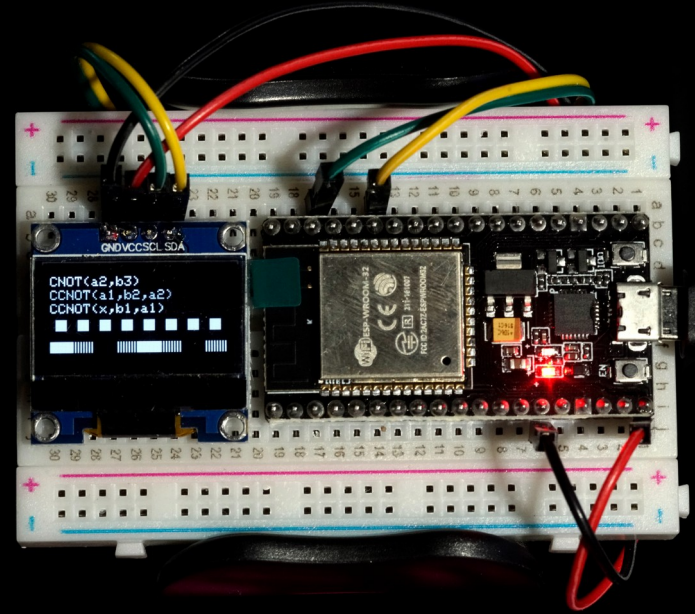


PBP as an Alternative to Quantum

Don't use *Array-of-Bits (AoB)*;
operate on *AoB chunk patterns*

- *Symbolic optimization at gate level*
- *Exponential space+time reduction*

Display shows 3 lines of scrolling
code trace, bit-per-pixel AoB map of
most recent *pbit* and SHOW *pbit*



PBP as Efficient Bit-Serial SIMD

Each entanglement channel is a PE!

- *Only active bits kept for a **pint***
- *Skips any repeated AoB operation*

*Display shows 3 lines of scrolling output, **current line of code**, count of **pbit** used, unique AoB chunks, and PBP:conventional gate activations*

