

Farewell to the Flop: A Post-Dennard Poem

By Max Hawkins

Isn't it funny
The metric we flaunt?
A computer that's better:
Faster! More flop/s!

So what is a flop?
It's a fine, funny thing
Been around some years
Well defined, so clean!

A flop is an op
On a float, not more
Than anything given
by (IEEE)-seven-five-four

You take sixty-four bits
Put them all in a line
Multiply, add them
Flops divine!

And for 40 odd years
This was stable and glad
Then Dennard died,
And architects went mad!

To speed up the math
And save on power
They chopped up the floats
Getting smaller each hour!

It meant less bits.
Less to transmit.
Less gates in hardware,
You have to commit

With less range, less precision
They built a new vision
For more than AI
These were big decisions!

The number of numbers
Each number could hold
Fell from a trillion
To 2, I'm told!

So when an app demands,
More bits than you've got,
Emulate.
What your hardware is not.

Now the old flop began to fail
A metric so rigid, and dusty, and stale
Too narrow. Too tiny. Simply too small,
To capture the breadth of computing, that's all!

For how does a noisy, a *wobbly* op,
Compare to a flawless one right at the top?
Or a tiny two-bit to a big sixty-four?
Is emulation as good as before?

To answer such questions,
Think channels!
Think Shannon!
His framework is canon!

Information is mutual
Determined throughout,
Measure the work:
Reduction of doubt!

The metric, I think
Is in Shannons per second,
How outputs from inputs
Are properly reckoned!

Computers are more
Than fast, perfect math.
That stubborn old notion
Is stuck in the past!

So farewell to the flop
Doubt drops to the floor
Let's go *Back to Bits*
To compute a bit more!