Fused Neural Network (FuNN) eNNgine
With Universal Human-Readable Inputs and Outputs

Features

- ❑ 16 Input X 16 Output X (up to) 16 Layer Neural Network with Selectable Activation (bias, if any, consumes one input).
- ❑ Computes directly with human-readable "H=8" decimal character sequence representations, automatically converting them to bfloat16 format for computations and then automatically converting outputs back to decimal character before automatically spilling into one of 256 result buffers.
- ❑ Only 1 clock per 32-input node (x[15:0], w[15:0]) computation time, equating to only 16 clocks per 16-node layer, using REPEAT instr.
- ❑ Submit data directly from spreadsheets, text editors, etc., without explicit conversion to binary format beforehand and retrieve results In human-readable decimal character format.

Universal input directly accepts H=7 DecimalCharSequence, binary64, 32, 16 and bfloat16 formatted data (X 32), in any combination

1|7|8 format (unrounded) "addition"

1|7|8 format (unrounded) "multiplication"

1|7|8 format (unrounded) "addition"

{SigD, RM[1:0]}_del

Human-readable y_i

rdenB

rdaddrsB[7:0]

rdenA

rdaddrsA[7:0]

Selectable Activation

SQNL
ReLU
Leaky ReLU
Hard Tan
SQ-RBF
Soft Max

Selectable H=7 convertTo DecChar, binary64, 32, 16 or bfloat16 output format

y[0] y[1] y[2] y[3] y[4] y[5] y[6] y[7] y[8] y[9] y[10] y[11] y[12] y[13] y[14] y[15]

rddataA[1023:0]

rddataB[1023:0]

ready

z_0

Layer 0

16 x 16 x 8-Character Result buffers for up to 16-node x 16-layer network (can be increased as required)

z_{15}

Layer 15

wren_del

wraddrs_del[7:0]

Preliminary Information

SYMPL Compute Engines