Corrections to "Hybrid Signed Convolution Module With Unsigned Divide-and-Conquer Multiplier for Energy-Efficient STT-MRAM-Based AI Accelerator"

Tao Li, Yitao Ma, Ko Yoshikawa, *Member, IEEE*, and Tetsuo Endoh, *Fellow IEEE*

IN THE above article [1], the reference numbers [10], [11], [12], and [13] in Table II were not correct and should be changed to [11], [12], [13], and [14]. The correct Table II is illustrated as follows.

TABLE II
COMPARISON WITH THE STATE-OF-THE-ART ACCELERATORS II

Parameters	This Work			[11]	[12]	[13]	[14]
Process (nm)		55		65	65	65	65
Voltage (V)		1.2		1.2	0.9	1.0	1.2
Frequency (MHz)		200		200	204	250	200
Power (mW)		25.86		165.3	274	278	88.6
N_{mul}	9	18	36	64	256	168	64
L_W	16	16	8	16	16	16	16
L_F	16	8	8	16	16	16	16
Average Power (mW)	2.87	1.44	0.72	2.58	1.07	1.65	1.38
Core Area (mm^2)	0.04	0.04	0.04	8	2.4	12.25	10.56
Average Area (mm^2)	0.0044	0.0022	0.0011	0.125	0.009375	0.0729	0.165

note: N_{mul}–number of multiplication, L_W, L_F–bit length of weight and feature map

REFERENCES

[1] T. Li, Y. Ma, K. Yoshikawa, and T. Endoh, "Hybrid signed convolution module with unsigned divide-and-conquer multiplier for energy-efficient STT-MRAM-based AI accelerator," *IEEE Trans. Very Large Scale Integr. (VLSI) Syst.*, early access, Feb. 22, 2023, doi: 10.1109/TVLSI.2023.3245099.

Manuscript received 30 March 2023; accepted 30 March 2023. Date of current version 23 May 2023. *(Corresponding author: Tetsuo Endoh.)*

Tao Li is with the School of Engineering and the Center for Innovative Integrated Electronic Systems (CIES), Tohoku University, Sendai 980-8577, Japan (e-mail: li.tao.e4@tohoku.ac.jp).

Yitao Ma and Ko Yoshikawa are with the Center for Innovative Integrated Electronic Systems (CIES), Tohoku University, Sendai 980-8577, Japan.

Tetsuo Endoh is with the School of Engineering, the Center for Innovative Integrated Electronic Systems (CIES), the Research Institute of Electrical Communication (RIEC), and the Center for Science and Innovation in Spintronics (CSIS), Tohoku University, Sendai 980-8577, Japan (e-mail: tetsuo.endoh.b8@tohoku.ac.jp).

Digital Object Identifier 10.1109/TVLSI.2023.3264100