

**Submission: Accelerating Spike-by-Spike Neural Networks on FPGA
with Hybrid Custom Floating-Point and Logarithmic Dot-Product
Approximation.**

April 13th, 2021

Dear associated editor,

We wish to resubmit our manuscript entitled, "Accelerating Spike-by-Spike Neural Networks on FPGA with Hybrid Custom Floating-Point and Logarithmic Dot-Product Approximation" for consideration as a research article in IEEE Access Journal.

In this paper, we present a scalable platform architecture for Spike-by-Spike neural network computation in embedded systems with hardware acceleration using vector dot-product approximation.

The key contribution of our research is the design of a dot-product hardware unit based on approximate computing with hybrid custom floating-point and logarithmic number representation. This approach leverages the intrinsic error resilience of neural networks to reduce computational latency, memory footprint, and power dissipation while preserving inference accuracy. Our vector dot-product approximation approach can be adaptable for other error resilient applications (e.g., image/video processing).

We believe our work is of substantial interest to many readers of IEEE Access Journal.

Thank you for your consideration.

Sincerely,
Yarib Nevarez