Institut für Theoretische Elektrotechnik und Mikroelektronik

Prof. Dr.-lng.

Alberto García-Ortiz

Otto-Hahn-Allee 1

NW1, Raum W3120

28359 Bremen

Telefon (0421) 218 - 62533

Fax (0421) 218 - 98 62533

eMail agarcia@item.uni-bremen.de

www [www.ids.item.uni-bremen.de](http://www.ids.item.uni-bremen.de/)

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

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