

☑ Universität Bremen · Fachbereich 01 · Postfach 33 04 40 · 28334 Bremen

Institut für Theoretische Elektrotechnik und Mikroelektronik

Prof. Dr.-Ing.

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

April 13th, 2021

Dear associated editor,

Approximation.

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.

Submission: Accelerating Spike-by-Spike Neural Networks on FPGA

with Hybrid Custom Floating-Point and Logarithmic Dot-Product

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