

# *An Experimental Study of Reduced-Voltage Operation in Modern FPGAs for Neural Network Acceleration*

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# Executive Summary

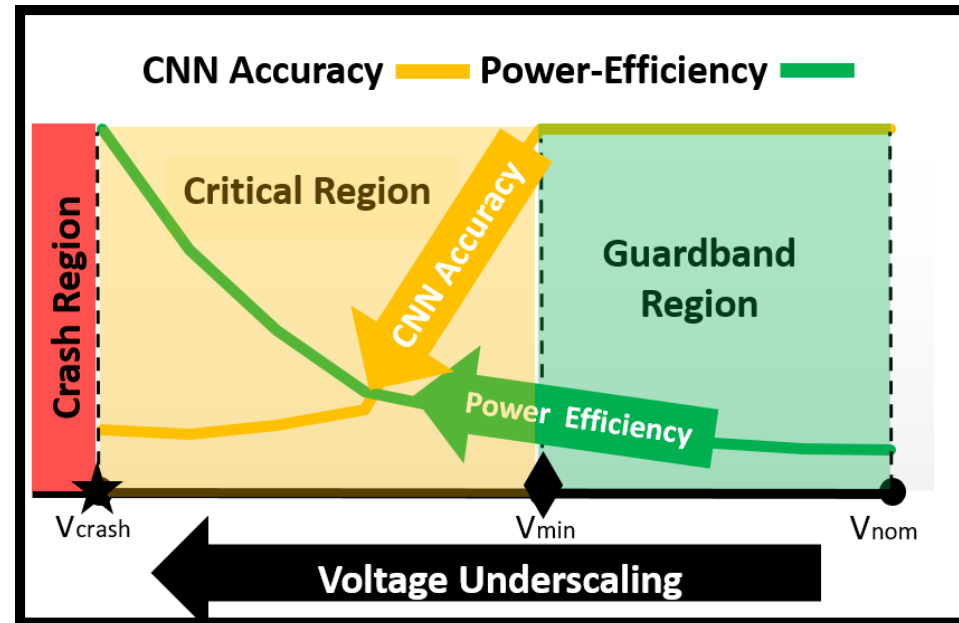
- **Goal:** Improve the **power-efficiency** of FPGA-based neural networks by:
  - ✓ **Undervolting** (i.e., underscaling supply voltage) **below nominal level**

## Evaluation Setup

- ✓ 5 Image classification workloads
- ✓ 3 Xilinx UltraScale+ ZCU102 platforms

## Main Results

- ✓ **Large voltage guardband** (i.e., **33%**)
- ✓ **>3X** power-efficiency gain



## In the Main Talk

- ✓ Characterization of FPGA voltage **behavior** and its impact on the **power-reliability**
- ✓ **Frequency** underscaling
- ✓ Environmental **temperature**



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