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ANDANTE

AI for New Devices And Technologies at the Edge

D2.1 Scorecard for eNVM target specificationsfor ANN and SNN

Deliverable No.	D2.1	**Due Date**	31-*Aug*-2020
Type	Report	**Dissemination Level**	*Confidential*
Version	1.0	**Status**	Final
Description	This deliverable aims to provide a scorecard for non-volatile memory target specs for ANN and SNN, including variability, stability, retention as well as performance targets and #bits/cell specs.		
Work Package	WP2 – New memory technologies for AI applications.		

Abstract (Published Summary)

Deliverable 2.1 introduces a set of target metrics to compare different embedded non-volatile memory (eNVM) devices in the context of neural network processing. The targets are estimates based on fundamental operation principles and device design considerations. In a later stage of WP2, the targets will be compared with the obtained numbers.

While eNVMs are often praised for their non-volatility and scalability, many other metrics need to be satisfied such as for example cell area and write energy. In this document, the different used metrics are first explained, and typical numbers are provided for each metric. Next, for each eNVM type, the operation principles and cell design are explained, and the targeted metrics are provided.

For this deliverable, imec has benchmarked SOT-MRAM and IGZO memory devices. CEA has benchmarked RRAM devices, Fraunhofer FeFET devices and ST PCM devices.

Finally, the different device metrics are compared. As a result, we see each memory device has its own advantages and disadvantages for different metrics such as area or number of levels. This deliverable can set the expectations for the further device development in this work-package.