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In-Memory-Computing Implementation of Magnetoresistive Networks for Ultra-Low-Power Computing

Aymen Romdhane¹, Bruno Lovison-Franco², Guillaume Prenat¹, Lorena Anghel¹, Pascal Benoit², David Novo²

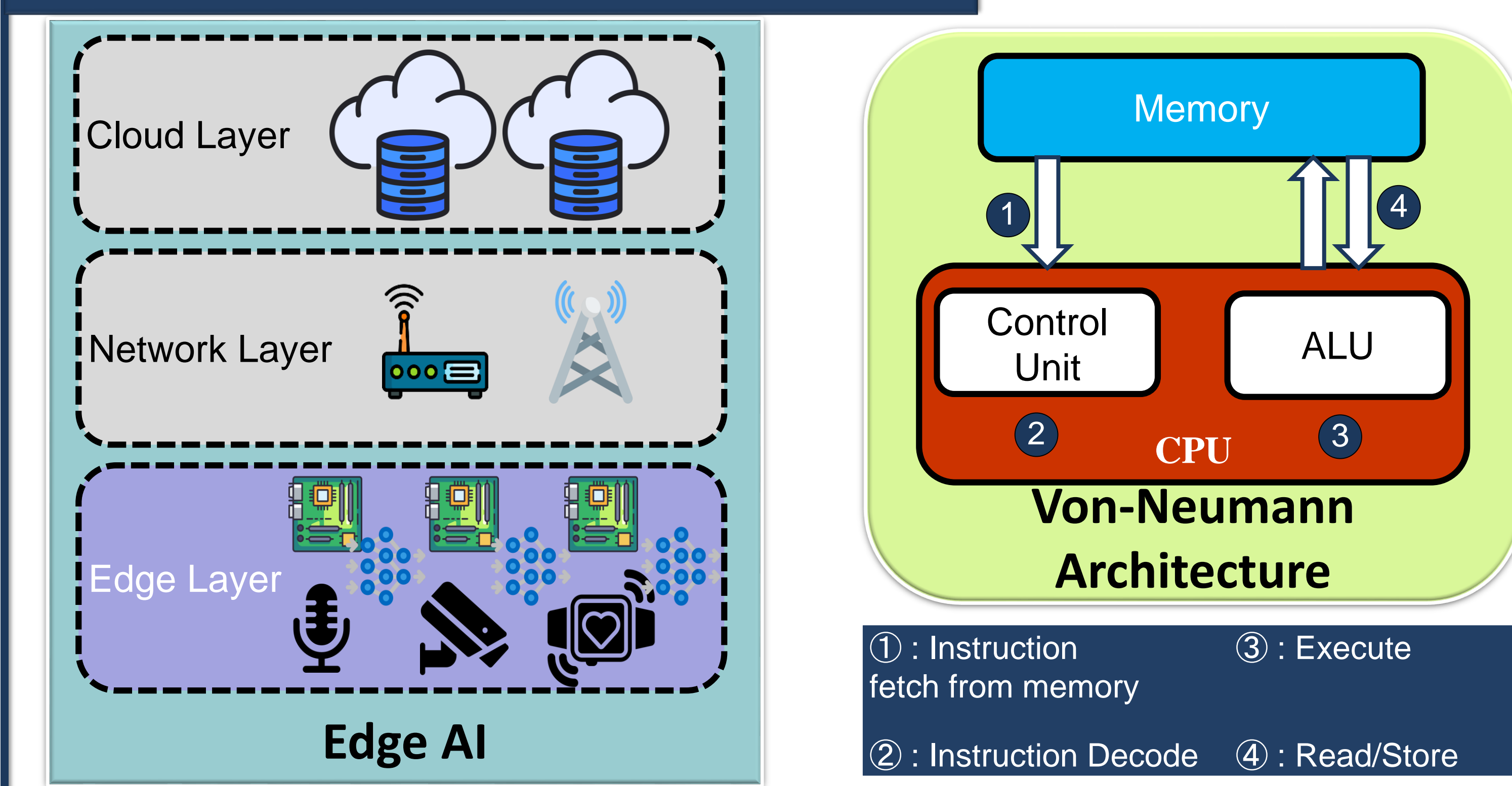
(1) Univ. Grenoble Alpes, CEA, CNRS, Grenoble INP, SPINTEC, 38000 Grenoble, France –

{firstname}.{lastname}@cea.fr

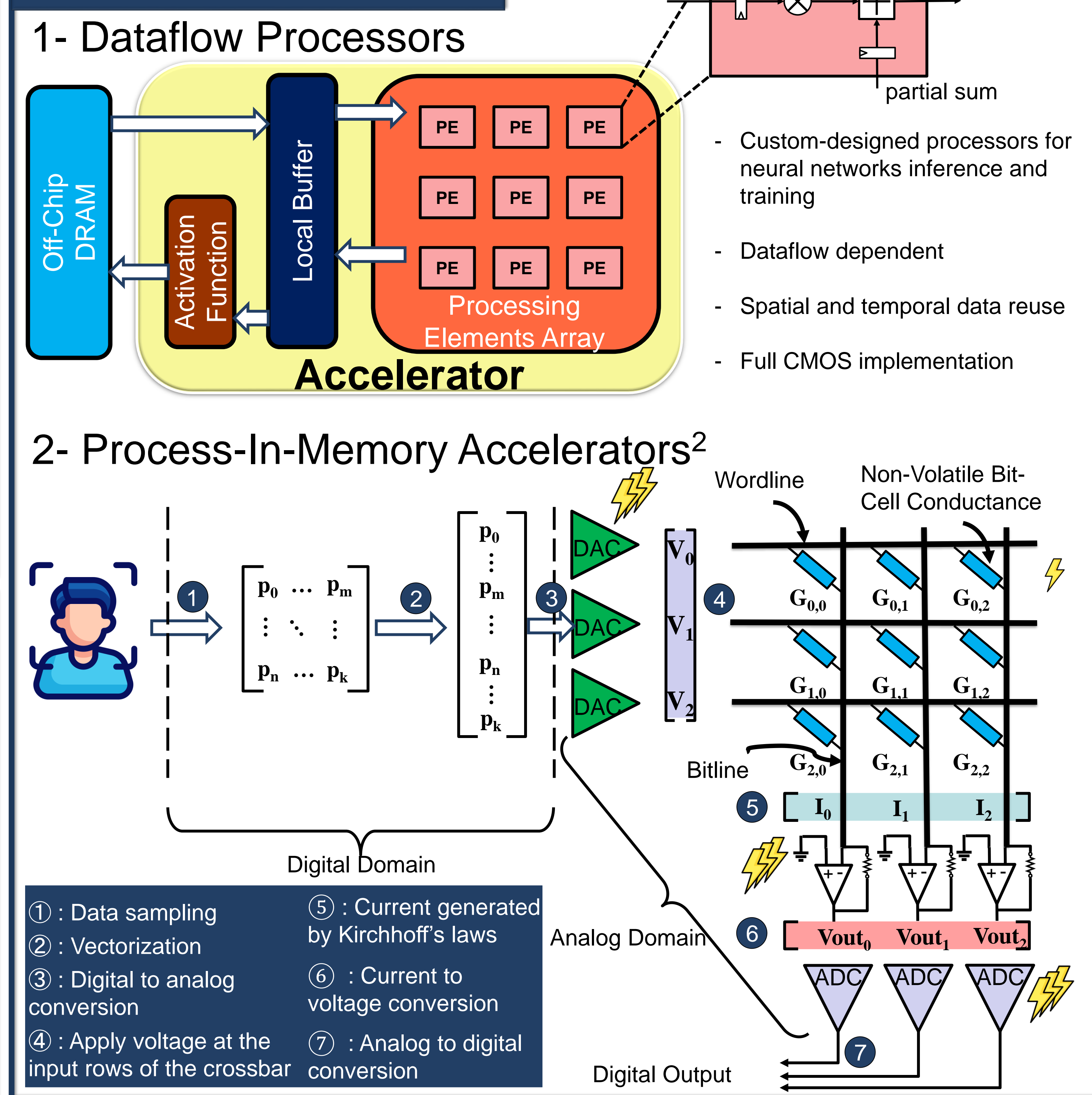
(2) LIRMM, 34000 Montpellier, France - {firstname}.{lastname}@lirmm.fr



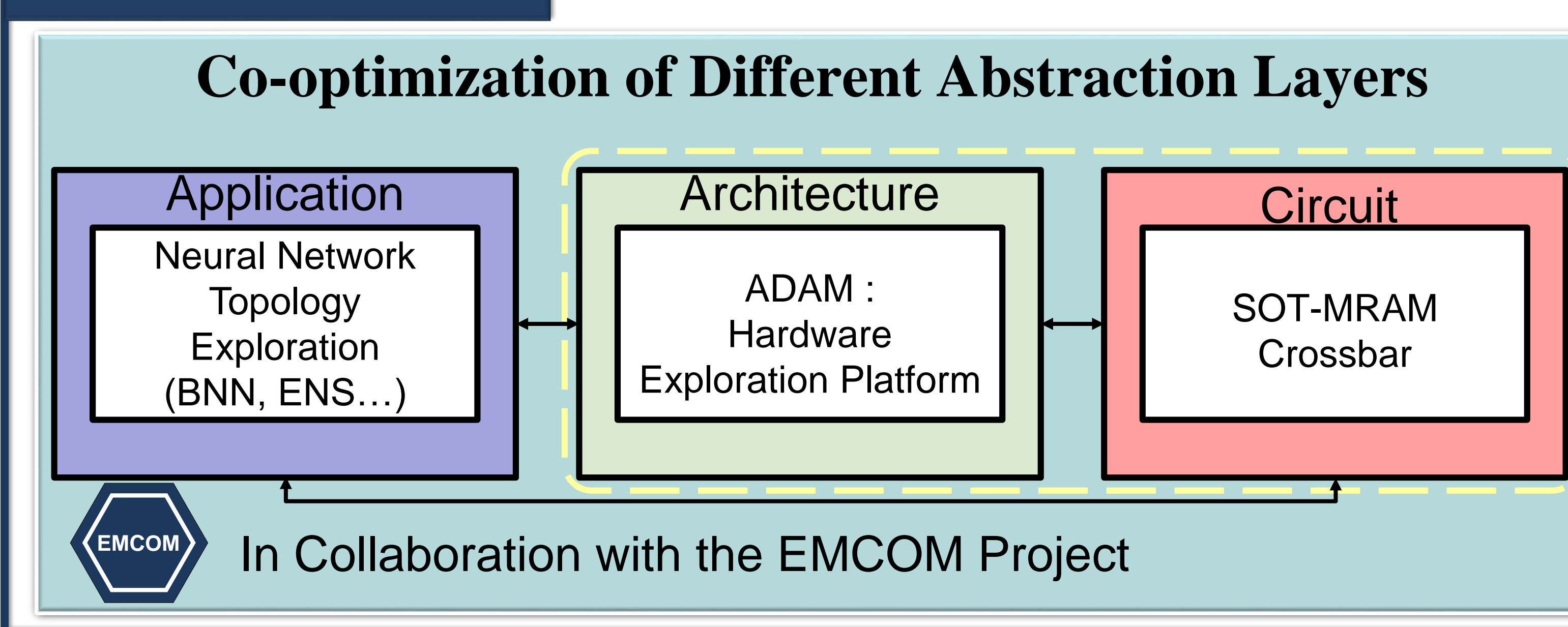
Edge AI & Von-Neumann Bottleneck



State of the Art Solutions

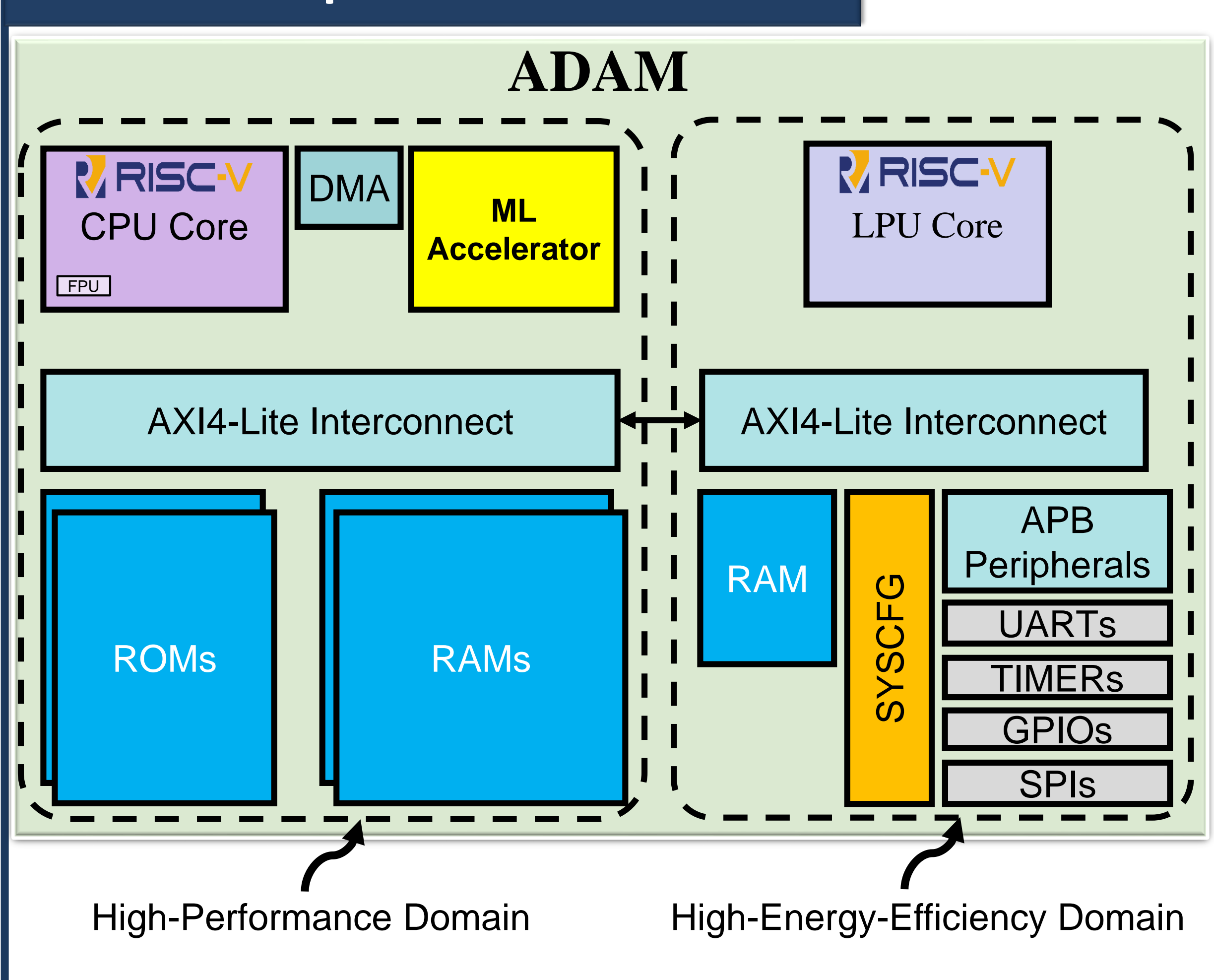


Objectives

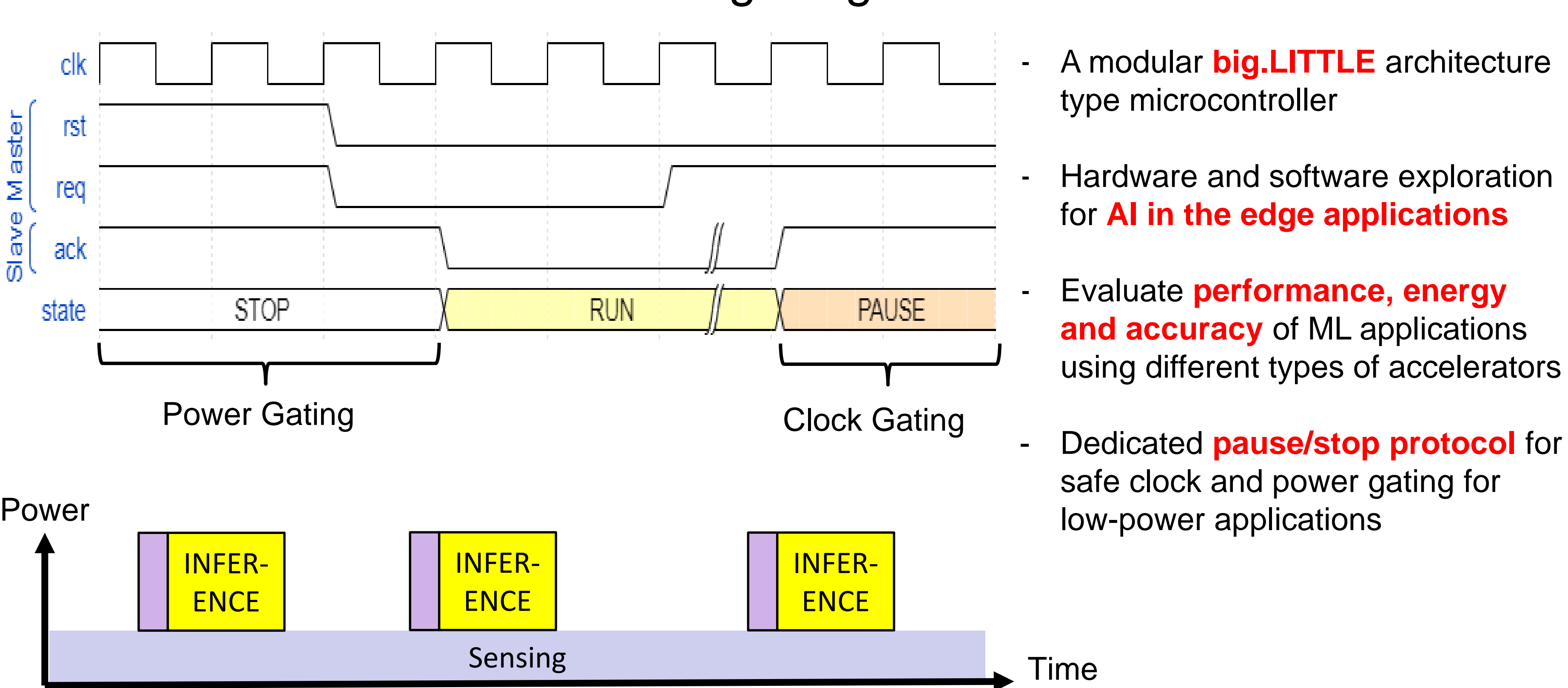


(1): Aguirre, F., Sebastian, A., Le Gallo, M., Song, W., Wang, T., Yang, J. J., ... & Lanza, M. (2024). Hardware implementation of memristor-based artificial neural networks. *Nature Communications*, 15(1), 1974.

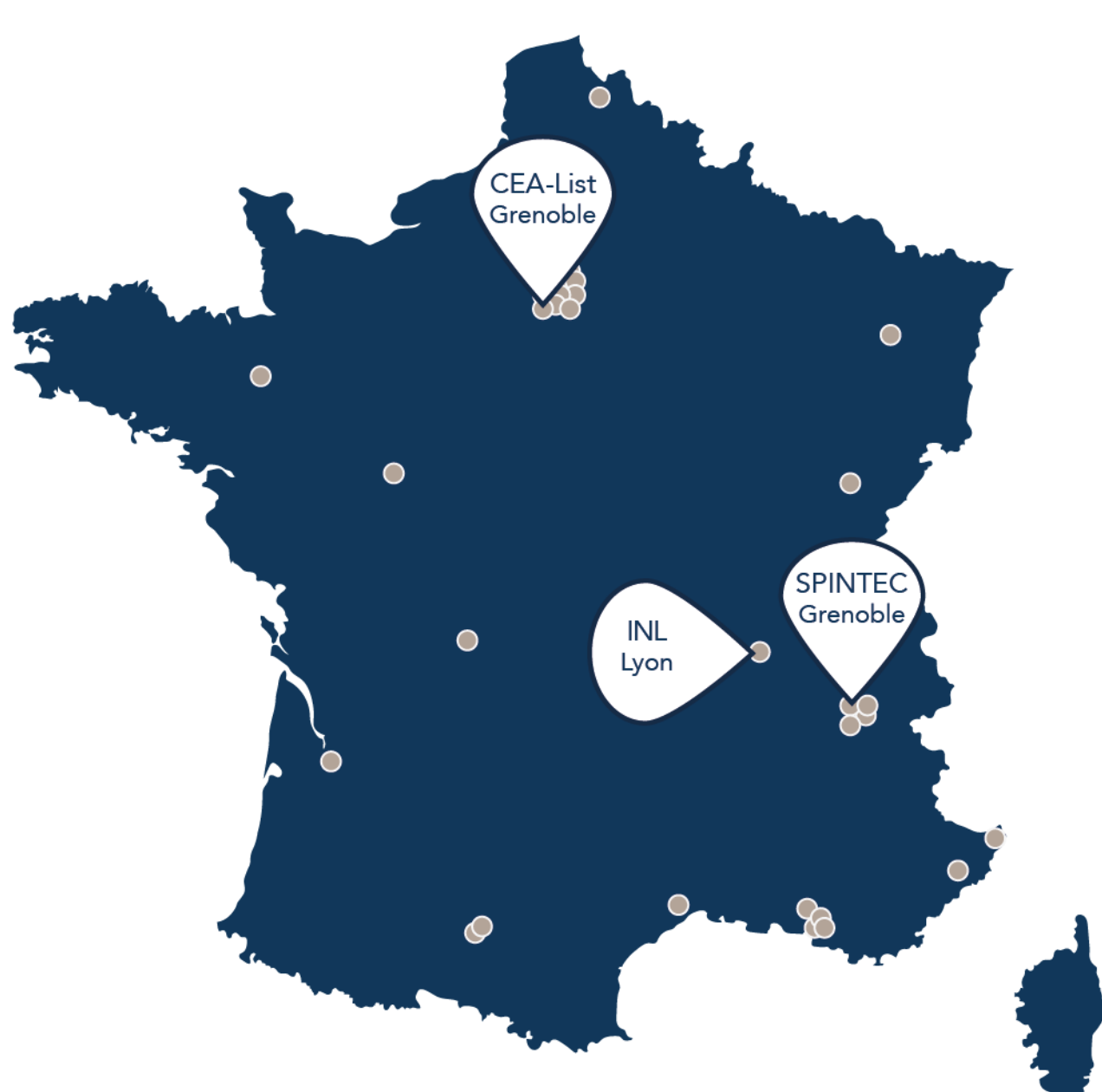
ADAM : ADAPtive Microcontroller



ADAM Pause Protocol Timing Diagram



Example of an Application Using big.LITTLE Architecture



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