



Séminaire Informatique Haute Performance au Campus Ter@tec
Département Sciences de la Simulation et de l'Information

Vendredi 18 Janvier 2019

11h – durée : 45 min

Bâtiment Ter@tec
Salle Valadon – RdC

Programming for In-Memory Computing.

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In-Memory Computing (IMC) corresponds to a new data computation concept that brings the computing operations inside the memory units. It has been introduced to overcome the von Neumann bottleneck in terms of data transfer rate and power consumption.

A new IMC system based on SRAM architecture is introduced. It permits performing logic operations (and, or, xor, etc), arithmetic operations (addition, subtraction, etc), and memory operations (set, reset, write, etc). IMC system permits highly parallel computation inside the memory.

At the current research stage, the circuit-level design of the IMC system has not been completed yet. We therefore introduce a dedicated software platform based on LLVM that includes emulation tools to early experiment and evaluate how applications can take advantage of the IMC system. We evaluate the execution time and the energy consumption and we compare to conventional CPU-based systems. We target different application scenarios in various fields (image processing, cryptography, intensive computation).