Team 18

Sidebar: Scratchpad Based Communication Between CPUs and Accelerators

-Group 18

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PROBLEM DESCRIPTION

1. Hardware accelerators are widely used for various neural network algorithms.
2. Accelerators are at their highest efficiency when optimized for a fixed functionality, which doesn't change over time. However, this inflexibility limits reuse of accelerators by different applications.
3. This is because matrix operations are relatively static but activation functions are fast evolving and this limit scalability of hardware.
4. Accelerators take much more time to compute activations functions while this can be done by processor much faster.

FINAL OUTCOMES

1. Interrupts instead of polling
2. Dynamic memory management to allow multiple applications to coexist.
3. Coming up with better scheduling policies for more efficient use of computing resources.

DONE TILL NOW

1. Go through the provided paper and get a gist of the implemented project
2. Installation of the required tools and dependencies (gem5 - aladdin)
3. Literature review: Reference: gem5-aladdin tutorial (Harvard UCLA ppt), The gem5 simulator, Binkert et al.; The aladdin approach to accelerator design and modeling, Shao et al.

WORK DISTRIBUTION (WEEK 1: Nov 1 - Nov 7)

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COMING UP NEXT...

1. Understanding code base.
2. Result verification / regeneration.
3. Making a custom accelerator in aladdin only.
4. Making a custom accelerator in gem5-aladdin with cache usage.
5. Learning how to make custom memory elements in gem5 for custom L1
6. Creating simplified version of scratchpad and shared L1
7. Coming up with a concurrency policy.

Thanks!