EECE528 Paper Review Sep20 Haotian Zhang #85979169

Main Contributions:

The paper is all about how to use data properly in loop structures, I think there are three main points need to be learnt from this paper. First thing is the reason for all the operations, we do all the work mentioned in the paper to reduce the number of intervening iterations and data fetch number between data reuses. Second thing is all those skew moves, this is the core method of the paper to achieve its optimize on reuse and localize. And the third thing is the group(combining) reuses, aka session 4.2, this part mentioned a lot of complex use of the algorithm, it's very different from the reuse from one array.

My Thoughts:

The first thought on my head after reading this paper is its limitations, the method basically need the loop and everything inside the loop to be certain. First, I thought this is a rare situation, maybe only can be used in dynamic programming and some other algorithms that follow a certain path. But then I realized it can be widely used in basically every part of a program when it requires matrix operating, so it's actually a huge break though, with basically no limitation for all the matrix things.

After that, I had some thoughts about the skew move, all the discussion on data reading is only for one array in multiple loops with only one-line code. That's a good beginning for a paper like this, but after that it only mentioned a little about complex use, and no example on more lines or multiple arrays. I think more discussion on either of these two will make it better and more practical. Because when the array number is two or more, trade off must be made for better performance, one array doesn't need to trade anything for better performance.

And one more thing is the paper mentioned that its algorithm can be very effective for large data sets, but it didn't mention anything about the actual memory structure, and how to deal with the situation that data are separated into 2 chips of memory, which sometimes do happen to big datasets.

Positive Point:

A new way to optimize the algorithm. Do something about data accessing order is a revolutionary method for me, remind me not only the code line order matters, the access order to the memory also matters a lot.

Negative Point:

It should talk more about more complex use, I'm sure they had a lot of thoughts on it, at least give them a future work session.

The bottom line (1=terrible, 5=fantastic): ______ **Grade (for professor): ______**