Milestone Report

Group Member

Xinghua An (anxh@cs.cmu.edu)

Ting Liu   (liv@andrew.cmu.edu)

Major Changes

1. As mentioned in the project proposal, our dynamic data prefetching algorithm needs to trace each load/store instruction to recognize the access pattern. However, it's impossible to implement in software level due to the performance concerns. Since JIAJIA is a page-size based software DSM, the only thing we can do is to trap into JiaJia's page-fault handle procedure (which handles remote memory access). Our modified page-size based prefetch algorithm aims to exploit the relationship between the reference sequences and the page sequences. Our theoretical proof shows that this algorithm can effectively discover stride access pattern given the sequence of virtual page numbers.

2. There is another issue we didn't realize in the proposal. If a page is successfully prefetched and accessed later, no page fault will occur then. That means we will lose some page numbers in the whole sequence. Such bad case might lead our prefetch algorithm to wrongly recognize the stride pattern. So we add a prefetch queue in our system instead of directly mapping the prefetched page into local memory to avoid page number miss caused by cache hit.

What We Have accomplished So Far

1. We have successfully compiled and configured JIAJIA under RedHat Linux.
2. We have tested a set of programs (i.e. FFT) using jia API under JIAJIA.
3. We have implemented our prefetch algorithm and combined it into JIAJIA's page-fault handler.

Meeting Our Milestone

So far we have almost met our milestone.

Revised Schedule

DATE	ANTICIPATED ACHIVEMENTS
11/21 – 11/25	Modify jia_barrier to reach scope-based cache coherence requirement (Xinghua)
11/26 – 11/27	Write test programs (MM, FFT) (Ting&Xinghua)
11/28 – 12/4	Test our system (Ting&Xinghua)
12/4 – 12/10	Write project report and poster (Ting&Xinghua)

Resource Needed

  Now our development and debug are performed on only 2 PCs. The final test should be run on at least 8 PCs. JIAJIA uses *rsh* to start remote process, however, no friends would like to install rsh rpm package and run rsh daemon on their PC due to the weak security of rsh and the complex configuration of rsh. I've sent email to Help Desk to ask for their help.

Please visit our website http://www.cmu -cssa/arch for all the information about our project.