



THE UNIVERSITY OF TENNESSEE

College of Engineering

The Min H. Kao Department of Electrical Engineering and Computer Science

- Announcement of a Master of Science – PILOT Presentation

202 Claxton

Friday, June 5, 2009 at 10:00 A.M.

“Performance Evaluation of the Matlab PCT for
Parallel Implementations of
Nonnegative Tensor Factorization”

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Increasingly large datasets acquired by NASA for global climate studies demand larger computation memory and higher CPU speed to mine out useful and revealing information. While boosting the CPU frequency is getting harder, clustering multiple lower performance computers thus becomes increasingly popular. This prompts a trend of parallelizing the existing algorithms and methods by mathematicians and computer scientists. In this PILOT study, I take on the task of parallelizing the Nonnegative Tensor Factorization (NTF) method for climate data, using the Parallel Computing Toolbox in Matlab. The Parallel Computing Toolbox lets you solve computationally and data-intensive problems on multicore and multiprocessor computers. Parallel processing constructs such as parallel for-loops and code blocks, distributed arrays, parallel numerical algorithms, and message-passing functions let you implement task- and data-parallel algorithms in MATLAB at a high level without programming for specific hardware and network architectures. I use methods provided in the Toolbox such as the Parfor loops and Distributed Jobs, for the Nonnegative Tensor Factorization code and evaluate and compare the results obtained from the different approaches over the performance achieved by the serial code.