

Cost of Explicitly Parallel Program Verification and Support

- Verification and support of a hand parallelized program is even more expensive
 - Application-level testing needs to cover a much larger state space
 - Should contain the verification complexity through guarantees at the interface level
 - Reproducing bugs can be very challenging, deterministic execution semantics help

Some of the points in "Software and the Concurrency Revolution." Sutter and Larus, ACM Queue 3(7), Sep. 2005.

Cost Of Parallel Program In Kmtc

David B. Skillicorn



Cost Of Parallel Program In Kmtc:

Finance ,2006 Cost-effective Parallel Computing University of Wisconsin--Madison. Computer Sciences Department,David A. Wood,1994 Abstract Many academic papers imply that parallel computing is only worthwhile when applications achieve nearly linear speedup i e execute nearly p times faster on p processors This note shows that parallel computing is cost effective whenever speedup exceeds costup the parallel system cost divided by uniprocessor cost Furthermore when applications have large memory requirements e g 512 megabytes the costup and hence speedup necessary to be cost effective can be much less than linear **Cost-effective Parallel Computing** University of Wisconsin--Madison. Computer Sciences Dept,David A. Wood,Mark Donald Hill,1994 Abstract Many academic papers imply that parallel computing is only worthwhile when applications achieve nearly linear speedup i e execute nearly p times faster on p processors This note shows that parallel computing is cost effective whenever speedup exceeds costup the parallel system cost divided by uniprocessor cost Furthermore when applications have large memory requirements e g 512 megabytes the costup and hence speedup necessary to be cost effective can be much less than linear A Realistic Cost Model for the Communication Time in Parallel Programs on Parallel Computers Using a Service Hardware Matthias Fischer,Alf Wachsmann,Jochen Rethmann,1996 **Deriving Parallel Programs from Specifications Using Cost Information** David B. Skillicorn,1991 Abstract A major step towards practical use of parallel computers is the integration of cost into transformational or derivational software development methods The difficulties with doing this come from the wide variety of parallel architectures possible and the effects of non uniform memory access and congestion phenomena This paper presents a model of costs that is compatible with refinement based methods of development that is much simpler than those previously suggested but which more accurately assesses the true costs of an implemented computation Decisions about architecture type and machine size can be made at any stage in the development even at the end **Shape-based Cost Analysis of Skeletal Parallel Programs** Yasushi Hayashi,Murray Cole,2001 This work presents an automatic cost analysis system for an implicitly parallel skeletal programming language Although deducing interesting dynamic characteristics of parallel programs and in particular run time is well known to be an intractable problem in the general case it can be alleviated by placing restrictions upon the programs which can be expressed By combining two research threads the skeletal and shapely paradigms which take this route we produce a completely automated computation and communication sensitive cost analysis system This builds on earlier work in the area by quantifying communication as well as computation costs with the former being derived for the Bulk Synchronous Parallel BSP model We present details of our shapely skeletal language and its BSP implementation strategy together with an account of the analysis mechanism by which program behaviour information such as shape and cost is statically deduced This information can be used at compile time to optimise a BSP implementation and to analyse computation and communication costs The analysis has been implemented in Haskell

We consider different algorithms expressed in our language for some example problems and illustrate each BSP implementation contrasting the analysis of their efficiency by traditional intuitive methods with that achieved by our cost calculator. The accuracy of cost predictions by our cost calculator against the run time of real parallel programs is tested experimentally. Previous shape based cost analysis required all elements of a vector or nestable bulk data structure to have the same shape. We partially relax this strict requirement on data structure regularity by introducing new shape expressions in our analysis framework. We demonstrate that this allows us to achieve the first automated analysis of a complete derivation of the well known maximum segment sum algorithm of Skillicorn and Cai.

Decentralized Optimal Power Pricing: the Development of a Parallel Program University of California, Berkeley. Computer Science Division, Steven S. Lumetta, L. Murphy, X. Li, D. Culler, I. Khalil, 1993. For MPPs to solve new and interesting problems they must support the development of sophisticated algorithms on very large data sets. Successful development depends strongly on the speed of the execution. Fixed cycle sequential machines cannot provide sufficiently fast execution of large problems but many programming systems available on MPPs today neglect the significance of time spent fixing an algorithm during development. Those systems which do address the fixed time commonly demand drastic sacrifices in execution speed. Between these two extremes is the middle ground where development must occur. We have implemented a new algorithm to solve an optimization problem for an electrical power system, a problem large enough to require significant computational resources. To help abstract the communication and layout requirements of the problem away from the main algorithm we have developed a small object system library. The results are an efficient and easily modifiable solution to the problem and a general approach to solving this class of problems.

An Analysis for Evaluating the Cost/profit Effectiveness of Parallel Systems Maria Teran, 2002. A new domain of commercial applications demands the development of inexpensive parallel computing platforms to lower the cost of operations and increase the business profit. The calculation of returns on an IT investment is now important to justify the decision of upgrading or replacing parallel systems. This thesis presents a framework of the performance and economic factors that are considered when evaluating a parallel system. We introduce a metric called the cost/profit effective metric which measures the effectiveness of a parallel system in terms of performance, cost, and profit. This metric describes the profit obtained from the performance of three different domains for scaling, speed up, throughput, and or scale up. Cost is measured by the actual costs of a parallel system. We present two cases of study to demonstrate the application of this metric and analyze the results to support the evaluation of the parallel system on each case.

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when evaluating a parallel system We introduce a metric called the cost profit effective metric which measures the effectiveness of a parallel system in terms of performance cost and profit This metric describes the profit obtained from the performance of three different domains for scaling speed up throughput and or scale up Cost is measured by the actual costs of a parallel system We present two cases of study to demonstrate the application of this metric and analyze the results to support the evaluation of the parallel system on each case

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