Function Level Parallelism Lead by Data Dependencies
Sean Rul and Hans Vandierendonck
Supervisor(s): Koen De Bosschere

Due to the rise of Chip multiprocessors (CMPs) the amount of parallel power has increased significantly. This is in contrast with the fact that a lot of programs are sequential and can not exploit these parallel resources. Therefore urging the need of developing new techniques to extract parallelism from sequential programs. In this paper a new profile based technique is presented. It works in a non-speculative way, based on data dependencies between functions and finds large chunks of code to parallelize. To achieve this, we introduce the so called interprocedural data flow graph and the data dependency graph. To test our technique we used the bzip2 program from the SPECcpu2000 benchmark suite. Our mechanism could significantly speedup the compression part 3.74 times, with a global speedup of 2.45 on a quad processor system.

Anycast Routing Algorithms for Effective Job Scheduling in Optical Grids
Tim Stevens and Marc De Leenheer
Supervisor(s): Filip De Turck, Bart Dhoedt and Piet Demeester

Effective job scheduling in optical grids requires concurrent optimisation of resource and network path selection. To enable this functionality, practical anycast routing algorithms are proposed, and simulation analysis is used to compare their performance to a pseudo-optimal bound and to several heuristics.

Phonological Features for Automatic Speech Recognition
Frederik Stouten
Supervisor(s): Jean-Pierre Martens

It is often argued that acoustic-phonetic or articulatory features could be beneficial to automatic speech recognition (ASR) because they provide a convenient interface between the acoustic and the linguistic level. Former research has shown that a combination of acoustic and articulatory information can lead to improved ASR. However there exists no purely articulatory driven ASR system that outperforms state-of-the-art systems driven by acoustic features. In this paper we propose a novel method for improving ASR on the basis of articulatory features. It is designed to take account of (1) the correlations between articulatory features and (2) the fact that not all articulatory features are relevant for the description of a certain phonetic unit. We also investigate to what extend an acoustic and an articulatory feature driven system make different errors and propose a lattice based combination method for both systems.
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