Project Overview

Microprocessor
Embedded
Custom

TRS Compiler

TRS

Malleable Caches
- Multimedia
- Real-Time
- Stream

Application

Malleable Architectures
- Arch. Specific ISA

High Level Architectures and Synthesis

MIT9904-04: Malleable Architectures for Adaptive Computing

Arvind, Larry Rudolph and Srinivas Devadas
Applications

Software-assisted cache replacement

Expansion Technology (Expansion Technology) System

Emulated on IBM MXT (Memory Expansion Technology) System

Job is running

Prefetch next job's data when current job is running

Software-assisted cache replacement

Time-shared processes are scheduled

Killed data before LRU data

Malleable Architectures for Adaptive Computing

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Progress Through June 2002
Research Plan for the Next Six Months

Avrind, Larry Rudolph, and Srinivas Devadas

MIT 9904-04: Malleable Architectures for Adaptive Computing

• Investigate methods to improve cache predictability
  - scratch-pad
  - Partition on-chip embedded memory into cache and embedded designs
• Complete evaluation of adaptive prefetching on IBM MXT machine
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- Compute-intensive benchmarks, including stream-based computations
- Interactive applications such as web-servers
- Next generation applications (voice, video, sensors)
- Study Machine Architecture for Stream Processing