ECE/CS 757: Advanced Computer Architecture II
Midterm 2 Review

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Lecture notes based on slides created by John Shen, Mark Hill, David Wood, Guri Sohi, and Jim Smith, Natalie Enright Jerger, and probably others
Midterm 2 Review

• Transaction Memory (Lect 8)
• Interconnection networks (Lect 9)
  – Topology
  – Routing
  – Flow Control
  – Router Microarchitecture
• SIMD (Lect 10)
• Massively Parallel Processors (Lect 11)
• Clusters (Lect 12)
• GPGPUs (Lect 13)
Transactional Memory

• Transactional programming model
• Hardware Implementation
• Virtual TM (brief)
• Hardware-assisted Software Transactional Memory (brief)
• Thread-level speculation (TLS)
TM Readings


Interconnection Networks

• Introduction to Networks
• Network Topologies
• Network Routing
• Network Flow Control
• Router Microarchitecture
Interconnect Readings


SIMD & MPP Topics

- SIMD introduction
- Automatic Parallelization for SIMD machines
- Vector Architectures
  - Cray-1 case study

- MPP Introduction
- Software Scaling
- Hardware Scaling
- Case studies
  - Cray T3D & T3E
SIMD & MPP Readings


Clusters

• Introduction & Examples

• Case studies
  – VAX Cluster
  – Google Cluster
  – IBM Blade Center
  – Microsoft Catapult

  http://www.morganclaypool.com/doi/abs/10.2200/S00516ED2V01Y201306CAC024
GPGPUs

- General Purpose Graphics Processing Unit (GPGPU)
- Programming model overview (SPMD, BSP)
- Hardware features (SIMT)
- Programming environment

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