

# CS184: Computer Architecture (Structure and Organization)

Day 24: March 9, 2005  
Wrapup



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## Today

- Review
- Next Quarter
- Admin
- Questions

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## This Course

- How to organize computations
- Requirements
- Design space (Parameterization)
- Characteristics of computations
  - Structure
- Building blocks
  - compute, interconnect, retiming, instructions, control
- Costs
- Comparisons, limits, tradeoffs

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## Content Overview

- This quarter:
  - building blocks and organization
  - raw components and their consequences
- Next quarter:
  - abstractions, models, techniques, systems

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## Design Space

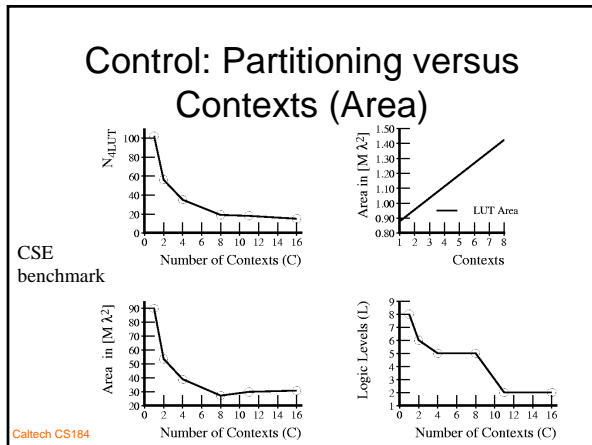
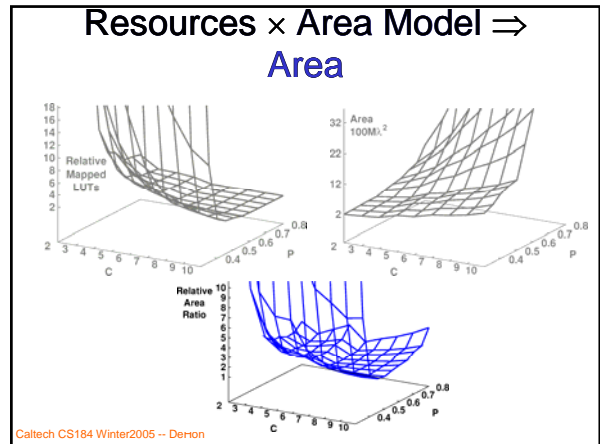
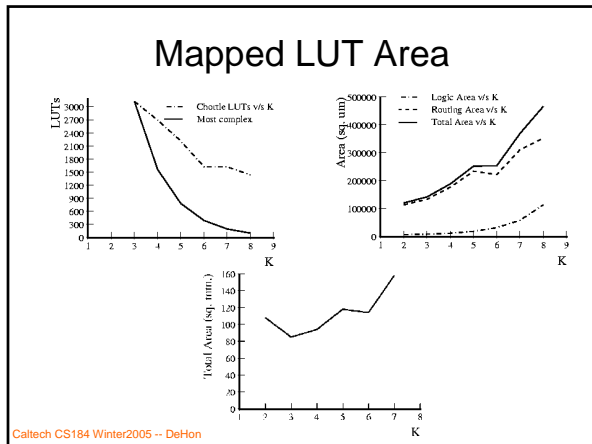
- Mindset
- Methodology
- Decomposition
  - fundamental building blocks
  - basis set
- Build Intuition on Space
  - grounded in quantifiable instances

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## Methodology

- Architecture model (parameterized)
- Cost model
- Important task characteristics
- Mapping Algorithm
  - Map to determine resources
- Apply cost model
- Digest results
  - find optimum (multiple?)
  - understand conflicts (avoidable?)

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- ### Course Big Ideas
- Matter Computes
  - Efficiency of architectures varies widely
  - Computation design is an engineering discipline
    - Design space
  - Costs change  $\Rightarrow$  Best solutions (architectures) change
  - Learn to cut through hype
    - analyze, think, critique, synthesize
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### Next Quarter

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- ### CS184 Sequence
- A - structure and organization
    - raw components, building blocks
    - design space
  - B – architectural abstractions and optimization
    - emphasis on abstractions and optimizations including quantification
    - single and multiple threads
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## Spring Quarter (1 of 2)

- “Architecture”
- Instruction-Set Architecture (ISA)
  - including pipeline parallelism
- Instruction-Level Parallelism (ILP)
- Memory Architecture and Optimization
  - Caching and Virtual Memory
- Binary Translation

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## Spring Quarter Topics (2 of 2)

- Dataflow
- Multithreaded
- Message Passing
- Shared Memory
- Vector/SIMD
- Multiprocessor Interface/Interconnect
- Defect and Fault Tolerance

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- Turnin feedback forms
- Final exercise
  - Wed. 3/16, 5pm, electronic turnin

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## Questions

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