Examples for Research Multiprocessors

Goals for Future Multiprocessors
- Performance through Parallelism
- Make parallel programming easier
- Power efficiency
- Specialized cores to improve performance for specific application
- Single-thread performance

Wavescalar
- Superscalar limitations
  - Complexity
  - Ignores dataflow locality (Wavescalar paper figure 1)
    - Prediction of the dependence of instructions through a dynamic trace of an application
  - Serial computing inherited from von Neumann model
- Wavescalar
  - Execute each instruction at most once
  - Instructions partially ordered (no loops)
  - Wave number: denotes different dynamic instances of the same variables
  - Wave cache: collection of instruction words, current working set of instructions with dedicated functional units (Wavescalar paper figure 3)

TRIPS
- TRIPS online slides

RAW
- RAW online slides

Project and Final Exam
- Project report, code and presentation due tomorrow (Wednesday) before class
  - What you need to submit: check course webpage
- Everybody needs to present
  - Presentation is part of your grade
  - I’ll send an email with presentation schedule
- Final Exam: Friday at 7 PM
  - Open book, notes, and calculator
  - Should be ~90 minutes
  - Mainly covers topics starting from memory consistency