

Term Paper Requirements

Each student in CE4930 must write a term paper that documents and describes one of the classic superscalar processors. Students are expected to complete independent research using the papers databases available from the library, textbooks from the library, internet resources, etc. Plagiarism from reference sources is a violation of academic honesty. Students are expected to research, take notes, and write their own words to describe their processor.

Here are some general suggestions for what will make a good paper:

- Processor organizational diagram
- Classification within the Shen and Lipasti processor classes
- Discussion of the pipeline stages
- Discussion of instruction fetch and dispatch
- Discussion of out-of-order techniques if appropriate
- Discussion of control hazard techniques
- Discussion of data hazard techniques
- Discussion of write back and reordering if out-of-order
- Assembly language examples
- Examples of systems the processor was used in
- Unique features that differ from techniques discussed in class

It is clear from the list above that the term paper must be of sufficient length to cover these topics. A two-page paper will not be acceptable. A ten page paper may cover the material appropriately.

Timeline:

- Monday of Week 8: Chip chosen, basic organizational diagram and summary paragraph written and submitted to instructor (n-way, in/out of order, Shen and Lipasti class). List of references including IEEE / ACM papers, books, and internet references.
- Monday of Week 9: Description of pipeline stages and instruction fetch/dispatch behavior added to document and submitted to instructor.
- Monday of Week 10: Superscalar techniques added to document and submitted to instructor.
- Monday of Week 11: Final version of report submitted to instructor.

A list of classic superscalar processors follows. Please choose from this list. If you wish to choose a processor not on this list then you must have the processor approved by the instructor prior to commencing your work.

AMD

- K5
- K6
- K7
- Bobcat
- Bulldozer
- Piledriver

ARM

- Cortex A8

Cyrix

- 6x86

DEC

- Alpha 21164 (EV4)
- Alpha 21364 (EV7)

Hitachi

- Super SH-2A

IBM

- RISC System/6000
- Power 1
- Power 4

Intel

- i960
- Pentium 4
- A number of Intel processors are used as lecture case studies. Thus, only two Intel processors are included in this term paper list.

Motorola / Freescale

- MC88110
- MC68060
- ColdFire V5

- PowerPC 604
- PWRficient

MIPS

- R8000
- R10000
- R12000

SPARC

- SuperSPARC
- UltraSPARC
- HyperSPARC