

6.375 Final Project

March 12, 2008

<http://csg.csail.mit.edu/6.375>

L14-1

Guidelines

- ◆ Ideally – groups of two
- ◆ Goal: A complex digital design - functional, useful & substantial
- ◆ Ideas related to your research domain welcome
- ◆ Past projects online – Spring 07, 06, 05
 - http://csg.csail.mit.edu/6.375/6_375_2007_projects.html
 - http://csg.csail.mit.edu/6.375/6_375_2006_projects.html
 - <http://csg.csail.mit.edu/6.884/projects.html>

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L14-2

Project Schedule

- ◆ Weekly project meetings and deadlines
- ◆ Intermediate reports due according to following schedule:

Date	Task
Mar 21	Preliminary proposal
Apr 04	Actual Project Proposal
Apr 11	High Level Design
Apr 25	Initial bluespec design
May 02	Design Exploration
May 12	Project Presentation
May 15	Project Report

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Ideas - FPU

- ◆ Floating Point Unit for MIPS
- ◆ Efficient architectures for
 - Addition/Subtraction
 - Multiplication
 - Division
 - Other operations – Roots, trigonometric
- ◆ IEEE 754 standard -
<http://grouper.ieee.org/groups/754/>
- ◆ Physical design extremely imp't – area, clock
- ◆ Parameterize on bit width, explore architectures

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Ideas – Network on Chip

- ◆ Design a simple interconnect model, flow control & traffic simulator
- ◆ Goal: Performance evaluation of router under traffic variation
- ◆ Lectures on Interconnect Networks
 - <http://cva.stanford.edu/classes/ee382c/handouts.html>
- ◆ Parameterizable Virtual Channel Flow control
 - System Verilog & Perl based library
<http://www-dyn.cl.cam.ac.uk/~rdm34/wiki/>

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Ideas – JPEG Decoder

- ◆ Standard for decoding image files
 - <http://www.w3.org/Graphics/JPEG/itu-t81.pdf>
- ◆ Goals – speed, area, features
- ◆ Parameterize for input size, input type
- ◆ Explore architectures
- ◆ Common SW implementations available online
 - <http://sourceforge.net/projects/mb-jpeg/>

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L14-6

Ideas - MIPS based projects

- ◆ Readymade testbenches
- ◆ OOO: Support for speculative execution
- ◆ Reorder buffer:
 - <http://csg.csail.mit.edu/pubs/memos/Memo-478/memo-478.pdf>
 - Past project: Group 4 Spring 2007
http://csg.csail.mit.edu/6.375/6_375_2007_projects.html
- ◆ Superscalar issue
- ◆ Complex Branch prediction