ECE 645, Computer Arithmetic  
Spring 2014

Instructor

Dr. Kris Gaj  
The Nguyen Engineering Building, room 3225  
Office hours: Monday 3:00-4:00 PM, Wednesday 3:00-4:00 PM, 7:30-8:30 PM, and by appointment

Lecture

Wednesday 4:30-7:10 PM, Aquia Building, room 219

Web page

http://ece.gmu.edu → Courses → ECE 645

Grading

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<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
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<tr>
<td>Project</td>
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<tr>
<td>Midterms Exam</td>
<td>20%</td>
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<td>Final Exam</td>
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Schedule (subject to possible modifications):

1. Objectives, Scope, and Organization. 01/22/2014  
2. Basic Adders and Counters. Implementation of Adders in FPGAs. 01/22/2014, 01/29/2014  
3. Carry-Lookahead and Carry-Select Adders. Hybrid Adders. 02/05/2014  
4. Conditional-Sum Adders and Parallel Prefix Network Adders. 02/12/2014  
5. Fixed-Point Representation. Endianness. 02/19/2014  
6. Floating-Point Representation. Rounding. 02/26/2014  
7. Operations in the Galois Fields. Modular Addition. Multioperand Addition. 03/05/2014  
8. Tree and Array Multipliers. 03/19/2014  
9. Midterm Exam. 03/26/2014  
10. Pipelined Multipliers, Squarers, Implementation of Multipliers in FPGAs. 04/02/2014  
13. Basic Dividers. Array Dividers. 04/23/2014  
14. Advanced Dividers. 04/30/2014  
Final Exam. 05/07/2014, 4:30-7:15pm
Project

Project can be done either individually or in groups of two students. The students can choose one of the following project types:

- Hardware projects: Design and comparison of selected computer arithmetic hardware architectures using VHDL or Verilog.
- Software projects: Development of efficient software implementations of selected arithmetic algorithms in a high-level programming language.
- Analytical projects: Literature search, analysis, and comparison of various computer arithmetic algorithms and architectures.

Literature

Required Textbooks


Supplementary Textbooks

