

ECE571: Advanced Microprocessor Design – Homework 5

Due: Tuesday 18 November 2014, 5PM

Create a document that contains the data and answers described in the sections below. A .pdf or .txt file is preferred but I can accept MS Office or Libreoffice format if necessary.

1. Read the Phase Change Memory paper and answer some questions

http://eece.maine.edu/~vweaver/classes/ece571/papers/HPCA2013_zhu.pdf

- (a) What is one advantage phase change memory has over DRAM?
- (b) What is one disadvantage phase change memory has over DRAM?
- (c) What limitations are there in their testing methodology? What changes might you suggest to make it more robust?
- (d) Do you think you could reproduce these results based solely on the contents of the paper?

2. Read the Raspberry Pi Cluster paper and answer some questions

http://web.eece.maine.edu/~vweaver/projects/pi-cluster/2014_cohpc_cluster_extended.pdf

- (a) Based on the features shown, which of the 10 embedded boards investigated would you use to build a 32-node cluster? Be sure to state your end goal (low-power, low-cost, high-performance, or some other goal entirely).
- (b) Would your answer change if the benchmark of interest for your cluster needed very high DRAM memory bandwidth?
- (c) If you were building a Raspberry Pi cluster and your metric you were optimizing was nJ/operation of HPL, what cluster size might be a good compromise between performance and cost?

3. Submitting your work.

- Create the document containing the data as well as answers to the questions asked.
- Please make sure your name appears in the document.
- e-mail the file to me by the homework deadline.