

Emmanuel Arzuaga Cruz

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OBJECTIVE:

Obtain a Research and Development position that allows me to enhance my knowledge in the area of Computer Architecture aware I/O Storage Systems, I/O Workload Characterization and Performance Evaluation.

EDUCATION:

PhD in Computer Engineering, Northeastern University, Boston, Massachusetts. PhD candidate in the ECE department. *Major*: Computer Architecture, *Minor*: Networks and Security. *Expected Graduation*: May 2009.

Ph.D. courses: *Computer Architecture, Computer Systems, Combinatorial Optimization, Cryptography and Communication Security, Computer Networks, Network Security.*

M.S. in Computer Engineering, University of Puerto Rico Mayagüez Campus, Electrical and Computer Engineering Graduate School, Graduation: December 2002.

Master courses: *Estimation, Detection, and Stochastic Processes, Optimization Theory, Numerical Linear Algebra, Object Oriented Programming, Advanced Topics on Pattern Recognition & Subsurface Sensing, Artificial Intelligence, Usability Engineering, Human Computer Interaction.*

B.S. in Computer Engineering, University of Puerto Rico Mayagüez Campus, Electrical and Computer Engineering Department, Graduation: May 2000.

WORK EXPERIENCE:

Graduate Intern Technical, May – August 2008.

Intel Corporation, Fort Collins Design Center, Fort Collins, Colorado.

- Created a synthetic enterprise workload that approximates the behavior of the TPC-C workload. This capability will allow the Itanium Processor Family (IPF) performance team to evaluate and identify performance enhancement possibilities for Itanium processor designs. The project involved extending the existing synthetic feeder to generate TPC-C like behavior that can be fed into the current performance models.

Research Intern, September 2006 – January 2007.

ExaGrid Systems Inc. Westborough, Massachusetts.

- Performed different tasks including software performance evaluation and testing, contrast and compare the effectiveness of delta compression techniques as well as other “data de-duplication” techniques based on Rabin’s fingerprinting, review and document existing delta compression algorithms, document Oracle 10g custom installation for their system. I also contributed in the implementation of new software solutions that may be integrated to their main system.

Research Assistant, May 2005 – Present.

Northeastern University Computer Architecture Research Group (NUCAR), ECE Department, Northeastern University.

- PhD research in the area of I/O Workload Characterization under the supervision of Prof. David Kaeli. We have worked on modeling and analyzing the behavior of Storage Systems. This work has involved the implementation of commercial workloads such as Online Transaction Processing and Decision Support Systems. We have conducted tests of such workloads to understand their impact on the underline storage system. This work has involved the installation, configuration and system administration of a 33 node computer cluster and its 16 TB storage array.

Center for Subsurface Sensing and Imaging Systems (CenSSIS), ECE Department, Northeastern University.

- Current Software Engineer of the CenSSIS Solutionware team under the supervision of Prof. David Kaeli. This project provides software engineering support for the development of subsurface sensing applications to the CenSSIS partner universities. We are currently working on the design and development of the CenSSIS Citation Index System.

Teaching Assistant, September 2004 – April 2005.

Electrical and Computer Engineering Department, Northeastern University.

- TA of ECEU324 *Computer Architecture*. The course presents both computer organization and computer architecture and covers all elements of a computer system, including the CPU, memory hierarchy, I/O and network.

Major themes in the course include: assembly language programming, memory addressing and organization, the role of technology, elements of an operating system and embedded design.

- TA of *ECEU326 Optimization Methods*. This course covers design and implementation of basic data structures, including arrays, lists, stacks, queues, trees, and graphs.

Instructor, August – December 2003.

Electrical and Computer Engineering Department, University of Puerto Rico Mayagüez Campus.

- Teach advanced undergraduate course *INEL5046-Pattern Recognition*. This course aims to introduce the students to the fundamental concepts of pattern recognition and provide them the ability to design pattern recognition based algorithms to analyze signals and images.

Software Developer, September 2002 – August 2004

Laboratory for Applied Remote Sensing and Image Processing (LARSIP), Electrical and Computer Engineering Department, University of Puerto Rico Mayagüez Campus.

- Development of software oriented to Image processing. Submit Technical Reports about project progress. Train LARSIP students & professors on how to use the software being developed.

PUBLICATIONS:

- Arzuaga, E., Kaeli, D.R., “*An M/G/1 Queue Model for Multiple Applications on Storage Area Networks*”, Eleventh Workshop on Computer Architecture Evaluation using Commercial Workloads (CAECW-11), conducted in conjunction with the 14th International Conference on High Performance Computer Architecture (HPCA-14), Salt Lake City, Utah, February 2008.

- Jimenez-Rodriguez, L.O., Arzuaga-Cruz, E., Velez-Reyes, M., “*Unsupervised Feature Extraction Methods and their effects in the Classification of High Dimensional Data*”, *Geoscience and Remote Sensing IEEE Transactions on*, Volume 45, Issue 2, February 2007 Page(s):469-483.

- Jimenez-Rodriguez, L.O., Rivera-Medina, J., Rodríguez-Díaz, E., Arzuaga-Cruz, E., Ramirez, M., “*Unsupervised Enhanced Classification for Homogeneous Objects Applied to High Resolution Imaging Spectrometry Data*”, *Geoscience and Remote Sensing, IEEE Transactions on* Volume 43, Issue 4, April 2005 Page(s):844 - 851.

- Arzuaga-Cruz, E., Jimenez-Rodriguez, L.O., Kaeli, D., Velez-Reyes, M., Rodríguez- Díaz, E., Santos-Campis, L., Santiago, C., “*A MATLAB Toolbox for Hyperspectral Image Analysis*” *Geoscience and Remote Sensing Symposium, 2004. IGARSS '04. Proceedings. 2004 IEEE International Volume 7, 20-24 Sept. 2004 Page(s):4839 - 4842.*

COMPUTER KNOWLEDGE:

- Excellent skills using the following programming languages: C/C++, JAVA, Scripting (Perl, shell), MATLAB, IDL/ENVI. Familiar with the following operating systems platforms: Windows, Sun Solaris, MAC OS (X and previous), LINUX (x86 and MAC versions).

LANGUAGES:

- Excellent oral and writing skills in Spanish and English.

SOCIETY MEMBERSHIP:

- Eta-Kappa-Nu Electrical and Computer Engineering Honor Society member.

- ACM, IEEE, IEEE-Computer Society and IEEE Communications Society graduate student member.

- 1999-2000 Region 9, President of the UPRM-IEEE Computer Society Student Chapter.

FIELDS OF INTEREST:

I/O Workload Characterization, Computer Architecture, Network security, Pattern Recognition, Remote Sensing, Artificial Intelligence, and Engineering Education.

REFERENCES:

Available upon request.