Miguel Lastras

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Personal Information

Full Name	**Miguel Angel Lastras Montaño**
Place of Birth	**San Luis Potosí, México**
Nationality	**Mexican**

Education

Summer 2012 – Present	**Doctor of Philosophy in Electrical and Computer Engineering** University of California, Santa Barbara Expected graduation: Summer 2016
Fall 2010 – Summer 2012	**Master of Science in Electrical and Computer Engineering** University of California, Santa Barbara GPA of 3.92/4
Fall 2008 – Summer 2010	**Master of Applied Science** Universidad Autónoma de San Luis Potosí, México GPA of 9.80/10
Fall 2004 – Summer 2008	**Bachelor in Engineering Physics** Universidad Autónoma de San Luis Potosí, México GPA of 9.76/10

Work Experience

Mar 2014 – Jun 2014 Jan 2013 – Mar 2013	**Teacher Assistant** University of California, Santa Barbara Advisors: Dr. Louise E. Moser Courses: *Introduction to Computer Networks, Distributed Systems*
Jun 2009 – Aug 2009	**Research Intern** IBM TJ Watson Research Center, Yorktown Heights, NY Advisors: Dr. John Alan Bivens, Dr. Maged M. Michael Project: *Dynamic Work Scheduling for GPU Systems*
Sep 2006 – Feb 2007	**Research Assistant** IICO/UASLP, San Luis Potosí, México Advisor: MS Jorge Loredo Murphy Project: *Development of an optical heater for substrate heating in a CVD system*

Skills

EDA tools	Cadence Virtuoso, SoC Encounter, Design Compiler, ModelSim, MultiSim
Computing	Programming Languages: C/C++, Objective-C, Mathematica, Matlab, LabVIEW, Java, VHDL, Verilog, MPI in C, GPU programming with CUDA Scripting Languages: Cadence SKILL, Linux Shell Script (Bash, Csh), Python Operating Systems: Proficient in Windows, OS X and Linux
Laboratory	Electronics: Electric signal processing, motor control, temperature control Materials: Scanning electron microscopy
Other	Lathe and milling machine Photography laboratory

Research Projects

2011-2016 **HyNANO: 3D Hybrid CMOS-Memristor Circuits, Architectures, and Applications**
Advisor: Dr. Tim Cheng
A DoD/AFOSR sponsored MURI program. Duties include:
▷ Leading a group of 10 in the effort of the monolithic 3D-integration of a CMOS chip with multiple memristive crossbar layers for the development of advanced information processing.
▷ Leading a group of 4 in the design and taping out of a CMOS chip platform for its integration with memristive devices.

2011 **Arithmetic Operations in Energy-Efficient GPUs**
Advisor: Dr. Behrooz Parhami
Analysis of the error characteristics of a logarithmic arithmetic unit as well as a proposal in the design that reduces the maximum percentage error in a converter by up to 15%.

2010 **Modeling of Epitaxial Growth of Semiconductors**
Advisor: Dr. Luis F. Lastras Martínez
Epitaxial growth modeling by Monte Carlo methods and its implementation on a GPU and in a computer grid using the MPI protocol.

2009 **Dynamic Work Scheduling for GPU Systems**
Advisors: Dr. John Alan Bivens, Dr. Maged M. Michael
Development and evaluation of work scheduling techniques on GPU systems. The value of work stealing concepts in GPUs was demonstrated by obtaining significant (1.8x – 4.5x) speedups in a shortest path benchmark developed during the internship.

2008 **LAGRID**
Advisor: Dr. Marcela Mejía Carlos
Participation in the IBM LAGRID project as a "LAGRID Scholar". Responsibilities included the development of the parallel infrastructure with 16 nodes.

2006 **Design and fabrication of an optical heater and its temperature control**
Advisor: MS Jorge Loredo Murphy
Modeling, design and fabrication of an ellipsoidal heater with its temperature control.

Publications

Mar 2016 **A low-power hybrid reconfigurable architecture for resistive random-access memories**
M. A. Lastras-Montaño, A. Ghofrani, K. T. Cheng
Accepted in International Symposium on High Performance Computer Architecture (HPCA), 2016

Jul 2015 **Architecting energy efficient crossbar-based memristive random-access memories**
M. A. Lastras-Montaño, A. Ghofrani, K. T. Cheng
In Nanoscale Architectures (NANOARCH), 2015

Jul 2015 **A Low-Power Variation-Aware Adaptive Write Scheme for Access-Transistor-Free Memristive Memory**
A. Ghofrani, M. A. Lastras-Montaño, S. Gaba, M. Payvand, W. Lu, L. Theogarajan, K. T. Cheng
In Journal on Emerging Technologies in Computing Systems (JETC), 12.1 (2015): 3

May 2015 **Vertical integration of memristors onto foundry CMOS dies using wafer-scale integration**
J. Rofeh, A. Sodhi, M. Payvand, M. A. Lastras-Montaño, A. Ghofrani, A. Madhavan, S. Yemenicioglu, K. T. Cheng, L. Theogarajan
In Electronic Components and Technology Conference (ECTC), 2015

May 2015 **A configurable CMOS memory platform for 3D-integrated memristors**
M. Payvand, A. Madhavan, M. A. Lastras-Montaño, A. Ghofrani, J. Rofeh, K. T. Cheng, D. Strukov, L. Theogarajan
In International Symposium on Circuits and Systems (ISCAS), 2015

Mar 2015 **HReRAM: A hybrid reconfigurable resistive random-access memory**
M. A. Lastras-Montaño, A. Ghofrani, K. T. Cheng
In Design Automation and Test in Europe (DATE), 2015

Feb 2015 **Reflectance-difference spectroscopy as a probe for semiconductor epitaxial growth monitoring**
A. Lastras-Martínez, J. Ortega-Gallegos, L. E. Guevara-Macías, O. Nuñez-Olvera, R. E. Balderas-Navarro, L. F. Lastras-Martínez, L. A. Lastras-Montaño, M. A. Lastras-Montaño
In Journal of Crystal Growth, 425 (2015): 21-24

Jan 2015 **Toward large-scale access-transistor-free memristive crossbars**
A. Ghofrani, M. A. Lastras-Montaño, K. T. Cheng
In Asia and South Pacific Design Automation Conference (ASP-DAC), 2015

Jun 2014 **Energy-Efficient GPGPU Architectures via Collaborative Compilation and Memristive Memory-Based Computing**
A. Rahimi, A. Ghofrani, M. A. Lastras-Montaño, K. T. Cheng, R. Gupta, L. Benini
In Design Automation Conference (DAC), 2014

Nov 2013 **A logarithmic approach to energy-efficient GPU arithmetic for mobile devices**
M. A. Lastras-Montaño, B. Parhami
In Asilomar Conference on Signals, Systems and Computers (ASILOMAR), 2013

Sep 2013 **Towards Data Reliable Crossbar-Based Memristive Memories**
A. Ghofrani, M. A. Lastras-Montaño, K. T. Cheng
In International Test Conference (ITC), 2013

Oct 2012 **A rapid reflectance-difference spectrometer for real-time semiconductor growth monitoring with sub-second time resolution**
O. Núñez-Olvera, R. E. Balderas-Navarro, J. Ortega-Gallegos, L. E. Guevara-Macías, A. Armenta-Franco, M. A. Lastras-Montaño, L. F. Lastras-Martínez, A. Lastras-Martínez
In Review of Scientific Instruments, 83.10 (2012): 103109

Sep 2010 **Dynamic Work Scheduling for GPU Systems**
M. A. Lastras-Montaño, M. M. Michael, J. A. Bivens
In International Workshop on GPUs and Scientific Applications (GPUScA), 2010

Mar 2010 **Simulating Crystal Growth in GPU Parallel Machines**
M. A. Lastras-Montaño, M. Mejía, L. F. Lastras-Martínez, J. Ortega-Gallegos
In International Supercomputing Conference in Mexico (ISUM), 2010

Talks and Poster Presentations

	HReRAM: A hybrid reconfigurable resistive random-access memory
May 2015	*Poster at the AFOSR's MURI HyNANO Annual Review, SUNY CNSE, Albany, NY*
Apr 2015	*Talk at the CDSC/InTrans Project Semi-Annual Meeting, UCLA, Los Angeles, CA*
Mar 2015	*Talk at the 6th Annual Non-Volatile Memories Workshop (NVMW) 2015, UCSD, San Diego, CA*
	A CMOS general purpose memory platform for 3D memristor integration
Mar 2014	*Poster at the AFOSR's MURI HyNANO Annual Review, UCSB, Santa Barbara, CA*
	Architecting low power crossbar-based memristive RAM
Mar 2013	*Talk at the 4th Annual Non-Volatile Memories Workshop (NVMW) 2013, UCSD, San Diego, CA*
	Architecting energy efficient crossbar-based memristive RAM
Jan 2013	*Poster at the AFOSR's MURI HyNANO Annual Review, Los Angeles AFB, Los Angeles, CA*

Languages

Spanish (native language)
English (fluent)

Academic Honors, Scholarships and Grants

2010 – 2015	CONACYT/UC-MEXUS Scholarship
Sep 2010	National Science Foundation Travel Grant, Vienna
Jun 2008	Highest GPA in the Class Award for the period 2007-2008
Jun 2006	Highest GPA in the Class Award for the period 2005-2006
Jun 2005	Highest GPA in the Class Award for the period 2004-2005

Hobbies

Classical piano
Digital photography