

Resume

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RESUME BRIEF

I got my Bachelor Diploma in **Communications and Electronics Engineering** at **Universidad de Guadalajara**, Mexico. Afterwards, I undertook a specialization course in **Semiconductors Technology Design and embedded systems (PADTS)** at Centre for Studies and Advanced Research (CINVESTAV-GDL), with a strong focus in embedded and SoIC design. Then, I worked at the **FPGA Lab at the Computer Sciences Department of the National Institute of Astrophysics, Optics and Electronics (INAOE)**, involved in several projects related to Infrared Imaging, 3D Digitization, Surveillance, with an important emphasis in FPGA systems design. I continued working with my chief at INAOE, Dr. Miguel Arias Estrada, in spin-off company, **Prefixa Vision Systems**, designing and developing vision systems and other solutions around the FPGA technologies.

Afterwards, I pursued a master degree, the **Erasmus Mundus Master in Computer Vision and Robotics**, hosted by a consortium formed by three universities: **Heriot-Watt University** (Scotland), **Universitat de Girona** (Spain) and **Université de Bourgogne** (France). Thanks to this program, I learned basic and advanced concepts of Computer Vision, Image Processing and Image Acquisition. I culminated the master with an internship in the **Medical Image Division of the Belgian company Barco**, where I did my thesis in reconfigurable computing applied to the development of video processing in medical displays. Thanks to the master program and the internship, I have acquired skills in software engineering and computer vision, and I accomplished my interest of combining my experience in embedded systems design and software and computer vision techniques for the development of medical imaging solutions.

AREAS OF INTEREST

- Medical imaging and medical systems.
- Reconfigurable Computing and Partial Dynamic Reconfiguration
- Computer Vision and Sensors Processing in biomedical and industrial systems.
- Systems development and integration around FPGA and DSP technologies.
- Embedded Systems Design.
- Smart Cameras.

SKILLS AND TOOLS

- Experience in FPGA Engineering, both in electronic design and programming. I have worked with Celoxica's Handel C and VHDL, mainly with Xilinx ISE. I also have worked with Mentor Graphics ModelSim and Xilinx ChipScope Pro for simulation and testing.
- DSP's programming. I have experience with Texas Instruments' TMD320VC5416 (5510) DSK and the family and the Code Composer Studio V2 compiler.
- Software Engineering Skills in Embedded C for Microcontrollers, VHDL, Handel C, C/C++.
- Printed Circuit Boards design using Mentor Graphics ORCAD and Protel's Altium Designer.
- Design and development of electronic systems, which has required my involvement in all the stages of the development of these products, from conceptualization, design, implementation, prototyping, manufacturing, among others.
- Matlab Programming for Digital Signal and Image Processing.
- Good communication skills. Through the master program I pursued, I learned to draft documents in English and I have written several reports, scientific papers, white papers, brochures and other documents, both in English and Spanish.

WORK HISTORY

BARCO – MEDICAL IMAGING DIVISION

Supervisor: Eng. Tim Verstraete – tim.verstraete@barco.com

Research Internship - FPGA Engineer

January 2009 – now

I am currently engaged in an internship/thesis in Barco Medical Imaging Division. The aim of my thesis was the study and development of a framework for Dynamic Partial Reconfiguration (DPR) in FPGA's tailored to the Digital Mammography Displays developed by the company. The title of the thesis was "Dynamic Partial Reconfiguration and Image Distribution in a reconfigurable platform" and involved the development of VHDL cores for several video interfaces, and the design of the aforementioned DPR framework in a Virtex 5 FPGA.

PREFIXA VISION SYSTEMS

Chief: Ph. D. Miguel Arias Estrada – ariasm@prefixa.com

Hardware and FPGA Engineer.

January 2006 – September 2007

Prefixa Vision Systems is a company aimed to the development of infrared cameras and thermal imaging, 3D imaging, medical systems and FPGA solutions. My work consisted in the conceptualization, design, development, fabrication and testing of FPGA embedded systems. Examples of such systems were a couple of thermo-graphic intelligent cameras, a 3MPix intelligent camera and a 3D Stereo Scanner, all of them featuring several communications and video interfaces and created around Xilinx's Spartan 3 FPGA.

Another major project was the development of all the electronics, Printed Circuit Boards and the system architecture of a novel Traffic Controller for a Mexican Company called EYSSA, the second largest provider of Traffic Control Systems in the country. This system was built around a PC-104 and used several FPGA and CPLD boards to support different functionalities.

INSTITUTO NACIONAL DE ASTROFÍSICA, ÓPTICA Y ELECTRÓNICA
FPGA Laboratory at Computer Sciences Department
Chief: Ph. D. Miguel Arias Estrada – ariasmo@inaoep.mx
Hardware and FPGA Engineer.
July 2004- September 2007

I worked in a multidisciplinary team at this laboratory of the INAOE. I was in charge of the conceptualization and design of several image acquisition systems such as infrared cameras, video processing units, communication interfaces and boards for various image sensors. I worked extensively in the design of electronic systems and PCB design, FPGA engineering and programming. My involvement in the projects required an intensive interaction with software and embedded systems engineers, optical engineers, mechanical engineers and to take care of the fabrication and mounting of the systems I helped to create. Therefore, I acquired good skills in project management and in working in multi – disciplinary team.

EDUCATION HISTORY

ERASMUS MUNDUS MASTER IN COMPUTER VISION AND ROBOTICS (VIBOT)
Heriot-Watt University (Scotland), Univ. de Girona (Spain), Université de Bourgogne (France)
www.vibot.org
September 2007- September 2009

The EM Master in Computer Vision and Robotics is held by a consortium of three European universities. The first semester was concerned with the introduction to the basics of Image Processing and Digital Signal Processing, among others. The second semester further developed solid foundations in image processing and introductory courses in computer vision for robotics. The last taught semester, it was focused on subjects related to image acquisition (3D Digitization, Infrared Imaging), but it also focused on several medical imaging acquisition and processing techniques (Medical Imaging, Biological Basis of Medical Imaging) and also Pattern Recognition.

The final semester was dedicated to my master thesis; I did a industrial internship in the Belgian company Barco Medical Imaging Division, working in some Real Time Image Processing and Video processing applications. Then I focused my research internship in the novel area of Dynamic Partial Reconfiguration of FPGA's to support the aforementioned video interfaces.

ADVANCED PROGRAM IN SEMICONDUCTORS TECHNOLOGY DESIGN (PADTS).
Centro de Tecnología de Semiconductores / CINVESTAV Unidad Guadalajara/Mexico
www.cts-design.com, www.gdl.cinvestav.mx.
March- July 2004

I attended to this specialization course, which is held by CTS and CINVESTAV, aimed to train engineers in the areas of ASIC – SoC systems design, as well as the creation of embedded systems solutions. I was part of the Orion Generation, a selected group of engineers from different parts of the country.

The topics covered through the six months course were:

- a) **C programming for embedded systems.**
- b) **VHDL Programming.**
- c) **Microcontrollers programming.**
- d) **Computer organization and design.**
- f) **DSP's Programming.**
- e) **Electronic Design.**

UNIVERSIDAD DE GUADALAJARA.
September 1999- January 2004.
www.udg.mx

I coursed bachelor studies in Electronics and Communications Engineering at Centro Universitario de Ciencias Exactas e Ingenierias (CUCEI), which depends of the Universidad de Guadalajara, the Mexico's second largest education institution. I got my diploma for noticeable fulfillments. I got a grade point average of 93.87 / 100.

LANGUAGES

Language	Writing	Reading	Listening	Speaking
Spanish (mother)	100%	100%	100%	100%
English	100%	100%	100%	100%
French	80%	100%	90%	80%

EXTRACURRICULAR / ACADEMIC ACTIVITIES

VII Summer of Scientific Research

Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE)

July – August 2002.

Advisor (s): Ph. D. Eduardo Tepichín Rodríguez
Chief of the Image Sciences Group, Optics Department

Project: “Modificación de un Videoprojector para su utilización como modulador espacial de luz coherente”.

VIII Summer of Scientific Research

Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE)

July – August 2003.

Advisor (s): Ph. D Eduardo Tepichín Rodriguez and Ph. D Alexandre Sherbakov.
Image Sciences Group, Optics Department.

Project: “Characterization of an Acusto- optical modulator”.