

J. FERNANDO ALFARO

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OBJECTIVE

Full time position in R&D MEMS, modeling, simulation and analysis of MEMS. Microfabrication, analog/RF IC design. Working in a multidisciplinary environment has improved my technical skills and leadership abilities, which will facilitate me to undertake any kind of responsibility

EDUCATION

Ph.D. **Carnegie Mellon University**
Robotics, May 2007

Thesis: "*A Multi Axial BioImplantable MEMS Array Bone Stress Sensor*"
Advised by Dr. Gary K. Fedder

M. Sc. **Carnegie Mellon University**
Robotics, August 2001

Thesis: "*Micro Media Actuation for Probe-Based Mass Data Storage*"
Advised by Dr. Gary K. Fedder
Selected Coursework: Advanced Analog IC Design, MEMS Design and Interface Circuits

B. Sc. **Monterrey Institute of Technology (ITESM, Monterrey Campus)**
Electronics Systems Engineering, December 1997
GPA 3.8/4.0
Graduated with high honors

RESEARCH EXPERIENCE

Institute for Complex Engineered Systems (ICES), Carnegie Mellon University

Postdoctoral Research Associate

July 2007 – Present

- Develop CMOS MEMS implantable sensors with integrated wireless interface
- Formation of research proposals with ICES and the MEMS Lab

MicroElectroMechanical Systems Laboratory, Carnegie Mellon University

Graduate Research Assistant

Sept. 1999 – May 2007

- Design, fabrication and characterization of a Wireless Bioimplantable MEMS Bone Stress Sensor using the Jazz 0.35 μm BiCMOS process technology
- Mechanical analysis of MEMS sensors and actuators using finite element tools (ANSYS, ABAQUS)
- Design and modeling of microstrip & coil antennas using HFSS and COMSOL
- Research in Ultra-High-Density Data Cache for Low-Power Communications

PUBLICATIONS

Fernando Alfaro, Lee Weiss, Phil Campbell, Mark Miller, Christa Heyward, John Doctor and Gary Fedder, "*Design of a Multi-Axis Implantable MEMS Sensor for Intraosseous Bone Stress Monitoring,*" IEEE Sensors Journal, Special Issue on In Vivo Sensors, in preparation 2007

F. Alfaro, L. Weiss, P. Campbell, M. Miller, C. Heyward, J. Doctor and G. Fedder, "*BioImplantable Bone Stress Sensor,*" The 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Sept. 1-4, 2005, Shanghai, China

P. Basset, J. F. Alfaro, D. Novosel, A. de la Plaza, D. Stancil and G. Fedder, "*ChipSize*" Antennas for Implantable Sensors and Smart Dust, in The 13th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS '05), pp. 457-460, June 5-9, 2005, Seoul, Korea

J. Fernando Alfaro and Gary K. Fedder. "*Actuation for Probe-Based Mass Data Storage,*" in Technical Proceedings of the Fifth International Conference on Modeling and Simulation of Microsystems, (MSM '02), pp. 202-205, April 22-25, 2002, San Juan, Puerto Rico

AWARDS and HONORS

COMEXUS Scholarship 1999-2001
IIE - Regional Academic Mobility Program (RAMP) Scholarship 1996
Supplementary Educational Program 93'-97'. ITESM, Monterrey
Honorific Mention, Top 10 class BS 97'. ITESM, Monterrey

PROFESSIONAL EXPERIENCE

Software Developer, DEXTRA Technologies, International (May 1998 – July 1999)
Develop applications using JAVA for high-tech equipment and PDAs with Ericsson at North Carolina
Certified Java Developer

Project Assistant, Department of Telecommunications and Networking, ITESM (Jan. 1996 – Dec. 1997)
Assist director of the department of Telecommunications in special projects.
Configure, install, maintain and document network equipment, computer hardware and software.

TEACHING EXPERIENCE

Teaching Associate, "Introduction to MEMS", Carnegie Mellon (Fall 2002, 2003, 2004)
Develop and teach MEMS Laboratory, grade lab reports, class assignments and exams.

PUBLIC SERVICE

Tour Guide, Robotics Institute (Aug. 2001 – Aug. 2006)
SocialCzar, Robotics Social Organization (Jan. 2001 - Jan. 2003)
Manage a group of ninety volunteer students to organize social events
Reviewer for multiple conferences (Aug. 2002 - Present)

SKILLS

Microfabrication: Design, fabrication and testing of Microelectromechanical Systems. Mask fabrication, photolithography, DRIE (STS), Plasma thermal etch, micro-structure release and characterization. Sputtering deposition.

Equipment: Light Interferometer (Wyko), Scanning Electron Microscope, Cascade Microtech 6" RF Probe Station, Agilent Network/Spectrum/Impedance Analyzer, dicing tools.

Application Software: ANSYS, Abaqus, HFSS, COMSOL, MATLAB, Simulink, Memcad, Cadence, LabView, Spectre, NODAS (CMU). Analog and DSP tools.

Programming Languages: JAVA & Swing (Certified Java developer), C/C++, Unix, Micro-Controllers, CORBA, JDBC, and Java Applets.

INTERESTS

A wide variety of sports. Primarily swimming, football and running
Painting, outdoor activities

PERSONAL

Fluent in English, French, Spanish, some Chinese. Learning Japanese.