

Guillermo Garcia

U.S Citizen

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Education

- UNIVERSITY OF CALIFORNIA-BERKELEY
Doctor of Philosophy in Mechanical Engineering
Adviser: Delia Milliron (The Molecular Foundry) Berkeley, CA
Candidate
- UNIVERSITY OF CALIFORNIA-BERKELEY
Professional Engineering Leadership Certificate
Fung Institute of Engineering Leadership Berkeley, CA
2011
- UNIVERSITY OF CALIFORNIA-BERKELEY
Management of Technology Certificate
Hass School of Business Berkeley, CA
2007-2009
- UNIVERSITY OF CALIFORNIA-BERKELEY
Master of Science in Mechanical Engineering
Thesis "*Silicon-Based Multimode Wavelength Division Multiplexing via Echelle Grating*"
Adviser: Samuel Mao (Enviornmental Energy Technology Division) Berkeley, CA
2007-2009
- UNIVERSITY OF SOUTHERN CALIFORNIA
Bachelor of Science in Mechanical Engineering Los Angeles, CA
2004-2007
- UNIVERSITY OF TEXAS AT EL PASO
Mechanical Engineering Major El Paso, TX
2003-2004

Experience

- DISTRIBUTED UTILITY ASSOCIATES
Research Staff (*Distributed Utility Integration Test*) San Ramon, CA
2009-2010
- Enhanced LabVIEW programming to test photovoltaic grid integration in both single and three phase applications.
 - Tested reliability and safety standards for several single/three phase inverter systems in the market.
- INTEL CORPORATION
Mechanical Engineering Graduate Intern (*Photonics Technology Laboratory*) Santa Clara, CA
2008-2009
- Characterized waveguide performance (transmission/coupling loss and temperature/polarization dependence) for a silicon based multimode echelle grating device.
 - Investigated wavelength dependence for three multimode waveguide dimensions (5x2, 5x6, & 5x20 um).
 - Produced LabVIEW programs and designed efficient DIE holder to optimize testing procedure for analyzing echelle grating performance.
 - Developed image processing technique for investigating waveguide transmission loss and wavelength dependence.
- LAWRENCE BERKELEY NATIONAL LABORATORY
Mechanical Engineering Intern (*Heavy Ion Fusion Energy Program*) Berkeley, CA
Summer 2006
- Designed target capsule, loading dock, and holding shelf for a diagnostic target chamber in the Neutralized Drift Compression Experiment (NDCX).
 - Created LabVIEW program to monitor and control target movement within diagnostic chamber.

Teaching

- UNIVERSITY OF CALIFORNIA-BERKELEY
Head Graduate Student Instructor (*Thermodynamics*) Berkeley, CA
2010
- Organized course logistics which included managing three graduate instructors and developing/maintaining course website.
 - Educated students on the principles of thermodynamics by holding weekly discussion sections that covered practice problems and theoretical material.

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UNIVERSITY OF CALIFORNIA-BERKELEY Berkeley, CA
Graduate Student Instructor (*Energy Conversion Principles*) 2009-2010

- Articulated energy conversion principles via solar, nuclear, chemical, electric, and combustion to 35 undergraduate students.
- Mentored students on various Matlab programming schemes used to analyze energy conversion devices.

UNIVERSITY OF CALIFORNIA-BERKELEY Berkeley, CA
Graduate Student Instructor (*Computer-Aided Mechanical Design*) 2009-2010

- Communicated various techniques for advanced computer aided design of mechanical objects with complex geometries using SolidWorks.
- Guided students on thermal and stress finite element analysis for various SolidWork mechanical designs via Cosmosworks.

UNIVERSITY OF SOUTHERN CALIFORNIA Los Angeles, CA
Teaching Assistant/Grader (*Mechatronics Laboratory*) 2006 – 2007

- Managed weekly labs based on mechanical, optical, and electrical subject matter by presenting initial instruction and guiding students through trouble shooting suggestions.
- Tutored various students in technical writing and effective lab techniques for productive results.

Research

LAWRENCE BERKLEEY NATIONAL LABORATORY / UC-BERKELEY Berkeley, CA
Inorganic Nanostructure Graduate Researcher (*Electrochromic window films*) 2010-Present

- Characterized electrochromic properties of indium tin oxide nanoparticle films and niobium oxide thin films.
- Optimized indium tin oxide nanoparticle film quality by investigating both annealing conditions and chemical treatment.

UNIVERSITY OF SOUTHERN CALIFORNIA Los Angeles, CA
Combustion Laboratory Research Assistant (*Nanocatalyst-based Photovoltaics*) 2006-2007

- Enhanced the optical absorbance of a nanophase titanium oxide photovoltaic for solar harvesting and hydrogen production by testing several inorganic doping materials.
- Designed cooling system to optimize deposition of titanium nano-particles during flame synthesis.

UNIVERSITY OF SOUTHERN CALIFORNIA Los Angeles, CA
Combustion Laboratory Research Assistant (*Frontal Polymerization*) 2005-2006

- Located limits to successful propagation for frontal polymerization by conducting lab-based experiments that measure and map buoyancy effects during propagation.
- Improved imaging process used to detect mechanisms of extinction and instability by developing appropriate set up for laser-induced fluorescent imaging.

Publications

- Mendelsberg, R.J., Garcia, G., Milliron, D.J. Extracting reliable electronic properties from transmission spectra of indium tin oxide thin films and nanocrystal films by careful application of the Drude theory. *J. Appl. Phys.* **111**, (2012) DOI: 10.1063/1.3695996.
- Garcia, G., et al. Dynamically modulating the surface plasmon of doped semiconductor nanocrystals. *Nano Letters*. **11**, 4415 (2011). (**Highlighted by Science Editor's choice**).
- **Conference Paper:** Tolmachoff, Erik D., Garcia, G., et. al., "Flame Synthesis of Nano-Phase TiO₂ Crystalline Films." Joints State Section of the 5th Combustion Institute Meeting, 25-28 March 2007, U of California San Diego.
- **Published Abstract:** Garcia, G. "Enhancing the Target Chamber for the Second Phase of the NDCX." Journal for Undergraduate Research, Department of Energy, Vol. 6, 2006.

Pending Patents

- D. Milliron, B.Helms, A. Llodes, R. Buonsanti, E. Runnerstrom, G. Garcia. "Nanocrystal-polymer nanocomposite electrochromic device" 2012
- D. Milliron, R. Tangirala, A. Llodes, R. Buonsanti, G. Garcia. "Spectrally-selective Near Infrared Electrochromic Device" 2011

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- D. Milliron, A. Lordes, R. Buonsanti, G. Garcia. “Universal Electrochromic Smart Window” 2011

Presentations

- “Electrochromic behavior of near-infrared selective metal oxide nanoparticle films”, Poster, 2011 Molecular Foundry User Meeting, Berkeley, CA, Oct 4 2011
- “Electrochromic behavior of near-infrared selective metal oxide nanoparticle films”, Poster, 2011 E-MRS Fall Meeting, Warsaw, Poland, Sept. 20th 2011.
- “Electrochromic behavior of metal oxide nanocrystal films,” INVITED SPEAKER, 2011 MRS Spring Meeting, San Francisco, CA, April 27th 2011.
- “Electrochromic behavior of indium tin oxide/niobium oxide nanocomposite films,” 2010 MRS Fall Meeting, Boston, MA, Dec. 1st 2010.
- “Electrochromic behavior of indium tin oxide/niobium oxide nanocomposite films”, Poster, 9th International Meeting on Electrochromism, Bourdeaux, France, Sept 8th 2010.

Skills

Language: Bilingual – English and Spanish

Software Programs: Pro/E, SolidWorks, Solid Edge, AutoCAD, LabVIEW, Matlab, MathCAD, ImageJ, SPIP Image, Excel, Power Point, MultiSim, EZ Lab, Indico Pro, Origin, Adobe Illustrator, Adobe Photoshop

Characterization: x-ray diffraction, scanning electron microscopy, profilometry, electrochemical impedance spectroscopy, optical spectroscopy, cyclic voltammetry, chronopotentiometry

Awards/

Achievements

Silicon Valley Region and UC Berkeley Venture Capital Investment Competition Winner	2012
Fung Engineering Leadership Scholar	2010-2011
Alfred P. Sloan Ph.D Fellowship	2009-2010
Alfred L. Brosio Fellowship	2007-2008
USC Viterbi School of Engineering Transfer Student of the Year	2006-2007
USC Merit Research Scholarship	2004-2007
Boeing Scholarship	2005-2007
University of Texas in El Paso Presidential Excellence Scholarship	2003-2004
John Daniel DECA Marketing Foundation Scholarship	2002-2003
Dean’s List (UTEP and USC)	2003-2007

Activities

Tau Beta Pi	2006 -Present
Society of Hispanic Professional Engineers	2004 - Present
American Society of Mechanical Engineers	2003 - Present
Pi Tau Sigma (<i>President</i>)	2006 -2007
Viterbi Student Ambassador	2006 -2007
Center for Engineering Diversity	2005 -2007
Joint Education Program	2005 -2006
USC Engineering Rome Overseas Program	Summer 2005