Jose L. Agraz PhD

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EDUCATION

- *Post-doc: Design for the senses as a tool for enhancing learning retention* *2*014
  - UC San Diego, CA/Baja Education; San Diego, CA

- *Ph.D.:Focus in para-Hydrogen Induced Polarization imaging instrumentation* *2*013
  - UC Los Angeles, CA/Northwestern University; Chicago, IL
  - CLIMB Scholar (Collaborative Learning and Integrated Mentoring in the Biosciences)

- *M.S. in Electrical Engineering* 2005
  - Pennsylvania State University (PSU); State College, PA
  - Λ (Lambda) Shaped Linear Piezoelectric Motor. US 7,501,743
  - Button-Weller Fellowship

- *CDMA Engineering Certificate* 2000
  - University of California San Diego; San Diego, CA

- *B.S. in Electrical Engineering* 1998
  - San Diego State University (SDSU); San Diego, CA
  - Research Advisor: Ramon Betancourt, Ph.D.
  - Co-Op; Lockheed Idaho. Idaho National Engineering Laboratory INEL (DOE)
  - MAERC and REMEC fellowships
  - Argonne Labs Fellowship (Did not attend due to a conflict with DOE fellowship)
  - 1st Prize: HVDC Converter Station Simulator using a personal computer using LabView
  - National Institutes of Health PREP Fellowship
  - Innovation Technology Award

RESEARCH EXPERIENCES

- **San Diego State University**

  Title: *Recording human motion while simultaneously producing music modulated by the same data (x, y, & z) coordinates*
  - **Description**: Monitoring system that quantifies movement using using LabView motion tracking software and the Kinect video camera, an inexpensive video camera used in the Xbox console game system
  - **Accomplishments**: Designed, built, and tested prototype. Human subject trials in progress
  - **Collaborations**: Robert Pozos Ph.D. and Daniel Muse
  - **Funding**: Baja Education
  - **Dates: 2014**

- **San Diego State University**

  Title: *Developing motion detection and recording systems that drive music's amplitude and pitch based in real time data (x, y, & z) coordinates*
  - **Description**: LabView real time cursor program, in which a person can draw an image and the xy coordinates drive the music (music modulation)
  - **Accomplishments**: Designed, built, and tested prototype. Human subject trials in progress
  - **Collaborations**: Robert Pozos Ph.D. and Daniel Muse
  - **Funding**: Baja Education
  - **Dates: 2014**

- **Cedars-Sinai Medical Center, Los Angeles**

  Title: Improvements in PHIP instrumentation
  - **Description**: Design and implementation of a 3rd generation PHIP instrument for MR imaging at the molecular level
  - **Accomplishments**: Implemented a precision voltage controlled current source for the generation of a static magnetic field for the PHIP method
  - **Collaborations**: Debiao Li Ph.D. and Shawn Wagner Ph.D.
  - **Funding**: Cedars-Sinai Medical Center
  - **Dates**: 2008 to 2013

- **Agraz Research Company**

  Title: Pilates Distance, Velocity, & Acceleration tracking
  - **Description**: Distance, Velocity, & Acceleration tracking using PIC microcontrollers for elderly rehabilitation tracking using Pilates rehabilitation machines
  - **Accomplishments**: Completed prototype composed of 14 PIC microcontrollers managing 104 infrared sensors through I^2C bus, distance, velocity, and acceleration displays.
  - **Collaborations**: Robert Pozos Ph.D., Baja Education Inc.
  - **Funding**: Baja Education Inc
  - **Dates**: June 2008 to June 2009

  Title: Blackjack Lucky Streaks: Statistical analysis
  - **Description**: Analysis of streaks and progressing betting in Blackjack.
  - **Accomplishments**: Completed streaks analysis and preliminary progressive betting strategy.
  - **Collaborations**: Cynthia Wiley, Chugach Inc.
  - **Funding**: Agraz Research.
  - **Dates**: August 2008 to present date

Title: Ultra sensitive Optical microphone & USB portable recording devices for non-invasive listening applications

- **Description**: Laser based ultrasensitive microphone for Homeland Security applications
- **Accomplishments:** Completed first prototype composed of inexpensive laser diode interferometer and enclosure with headphone output.
- **Collaborations**; Robert Pozos Ph.D., Baja Education Inc.
- **Funding**: Baja Education Inc
- **Dates**: November 2006 to August 2007

Title: Force measuring device for skin blood flow obstruction for near infrared spectroscopy optical probes

- **Description**: Calibrated force sensor measuring device for deep muscle oxygen concentration measurement applications.
- **Accomplishments:** Completed prototype attached to Hutchinson's optical probe and produced force measurement data for ongoing optical probe algorithm prove of concept.
- **Collaborations**; Robert Pozos Ph.D., Baja Education Inc. Joseph Ortner, Hutchinson Technologies. John Lopez, SDSU.
- **Funding**: Baja Education Inc & Hutchinson Technologies
- **Dates**: June 2006 to July 2007

Title: Space Surveillance IF to Audio Baseband down converter

- **Description**; RF to audio band converter of Air Force Space Surveillance early detection system. An economic backup system for the Air Force Space Surveillance San Diego Field Station
- **Accomplishments:** Completed prototype effectively down converting RF signals from the station's Alert antenna to audio band for data collection.
- **Collaborations**; Cynthia Wiley, Chugach Inc. & Air Force Space Surveillance San Diego Field Station
- **Funding**: Chugach Inc
- **Dates**: February 2006 to June 2006

Title: Electronic Race Alternator (Racemate II)

- **Description**; Microcontroller controlled racing permanent magnet alternator for currents beyond 32 amps
- **Accomplishments:** Completed prototype for currents up to 20 amps.
- **Collaborations**; John Barrett
- **Funding**: Racemate inc & Agraz Research
- **Dates**: March 2000 to September 2000

- **Air Force Space Surveillance San Diego Field Station**

Title: LabView stand alone space surveillance data capture and report generator

- **Description**; Data parsing program for Air Force Space Surveillance receivers and transmitters performance evaluation.
- **Accomplishments:** Completed and distributed stand alone LabView application with self installation routine for parsing receivers & transmitters performance evaluation.
- **Collaborations**; Cynthia Wiley, Chugach Inc. Russell Donalson, Chugach Inc.
- **Funding**: Chugach Inc
- **Dates**: October 2006 to September 2007

- **Pennsylvania State University**

Title: Λ (Lambda) Shaped Linear Piezoelectric Motor

- **Description**: No moving parts, inexpensive, non-magnetic Piezoelectric Motor for fiber optic alignment applications.
- **Accomplishments**: Completed proof of concept prototype and tape cast mass production prototypes PZT motor.
- **Collaborations**: Amanda Baker, PSU.
- **Funding**: Pennsylvania State University
- **Dates**: September 2002 to September 2004

- **San Diego State University**

  Title: Finger Force and Acceleration Sensor Instrumentation Design
  - **Description**: Quantification of carpal tunnel syndrome injuries.
  - **Accomplishments**: Completed prototype for finger force, acceleration, and EMG measurements of the forearm.
  - **Collaborations**: Robert Pozos Ph.D., Baja Education Inc.
  - **Funding**: Baja Education Inc
  - **Dates**: September 2002 to January 2003

  Title: Finger Force Sensor Instrumentation Design
  - **Description**: Quantification of carpal tunnel syndrome injuries.
  - **Accomplishments**: Completed prototype for finger force and EMG measurements of the forearm.
  - **Collaborations**: Robert Pozos Ph.D., Baja Education Inc.
  - **Funding**: Baja Education Inc
  - **Dates**: November 2002 to May 2003

  Title: AutoCAD Interactive Drawing-Data Base Program
  - **Description**; Lisp data base for SCADA system at the INEL.
  - **Accomplishments**: Completed AutoCAD Lisp application for SCADA system database.
  - **Collaborations**; Robert Pozos Ph.D., SDSU.
  - **Funding**: Lockheed Inc
  - **Dates**: September 1995 to September 1996

  Title: HVDC Converter Station Simulator
  - **escription**; SDG&E simulator using LabView.
  - **Accomplishments**: Completes application for SDG&E training purposes.
  - **Collaborations**; Ramon Betancourt Ph.D., SDSU.
  - **Funding**: DOE
  - **Dates**: September 1993 to September 1994

- **Ectron Corp**

  Title: LabView Virtual Instrument Drive for T/C Simulator Calibrators
  - **Description**; Software driver for 1120 T/C Simulator Calibrators.
  - **Accomplishments**: Completed software driver and posted it on National Instruments database.
  - **Collaborations**; Jack Thomas, Ectron Inc.
  - **Funding**: Ectron Inc
  - **Dates**: May 1995 to September 1995

TEACHING EXPERIENCES

- Electrical Engineering Micro Electronic Circuits Laboratory Instructor (EE430L & EE330L). San Diego State University. 1/98 – 02/00 San Diego, CA.
- Analog Circuits lecturer
  Southwestern College. 1/98-5/98. Chula Vista, CA

PATENTS

- Improved Device and Methods for para-Hydrogen Induced Polarization. U.S. Provisional #61/698,488
- Piezoelectric ultrasonic motor for 2-dimensional positioning. US Patent #7,501,743
- Fatigue monitoring device and method. US Patent # 6,352,516. Europe Patent # WO0172223
- Force monitoring device and method. US Patent # 6,673,026
- Systems and Methods for Dynamic Analysis of Muscle Function and Metabolism. Europe Patent # WO2005055815**

EMPLOYMENT

01/05 – Present: *POST DOC* .
SDSU/Baja Education, California. xxxxxx.

09/08 – 09/2013: *RESEARCH ASSISTANT*
Cedars-Sinai Medical Center, Los Angeles /Northwestern University, Chicago, Illinois. Development of Hyperpolarization Instrumentation for cancer imaging at the molecular level.

09/06 – 02/08, 10/94 – 09/03: *SHIFT TECHNICIAN-ELECTRONIC TECHNICIAN II*
Air Force Space Surveillance Station. **San Diego, California**. LabView programming of the System Control Satellite Data Acquisition for the U.S. Air Force (Chugach). Monitoring the operation of the satellite detection system while identifying, isolating, and resolving all system failures.

06/03 – 09/04: *RESEARCH ASSISTANT*
Pennsylvania State University. **University Park, Pennsylvania.** Development of Piezoelectric motors.

02/00 – 12/02: *SENIOR TEST ENGINEER*
Cadence Designs. **San Diego, CA**. Characterization of mixed signal ASIC devices using Credence & Teradyne testers.

1996: *ENGINEER/MARKETING*

REMEC (Fellowship). San Diego, CA. Design of a RF FILTER windows program to estimate cost depending on filter specifications (LabWindows CVI). The second generation of REMEC RF filter design program.

6/93 to 8/96: *ASSOCIATE RESEARCHER*

Lockheed & EG&G (Co-Op & Fellowship). Idaho National Engineering Laboratory (INEL). Idaho Falls, ID.
Design of Interactive Drawing-Data Base Program for SCADA system at the INEL using Lisp AutoCAD.
Design of Cape Canaveral's ROCC synchronizer project (NASA) and Ascension Island Wind Farm (USAF).

11/89 - 12/94: *SENIOR TEST TECHNICIAN*

Ectron Corp. San Diego, California. Programming and design of automatic test equipment (ATE) systems for the testing of Thermocouple Simulator Calibrators.

SPECIAL SKILLS

- Owner Agraz Research Co, focusing on RF ASIC Test and Applications Development, CA. 2006
- Co-Owner ErgoStress Corp, focusing on instrumentation to quantify and detect RSI, CA. 2000
- I program in most commonly used programming languages, e.g LabView, Pearl, Matlab, C, Solidworks, HTML, AutoCad Lisp, & HP Basic.
- Analog/Digital & RF design; RF down converters, switching power supplies, FPAA, instrumentation, portable recording devices, and PIC & Stamp microcontroller designs
- Spanish: fluent in speaking and reading

PEER-REVIEWED PUBLICATIONS

- Improved PHIP Polarization using a Low Noise Precision Voltage Controlled Current Source, JMR 235(2013) 77-84
- PHIP Instrumentation Pinch Valve System for Sample Delivery, Process and Collection. Adv.Biom. Sci. Eng. July (2014)
- LabVIEW-based Control Software for para-Hydrogen Induced Polarization Instrumentation, RSI 85, 044705 (2014)
- Quantitative Characterization of a Catalyzed PHIP Reaction. ISMRM, Jan (2013)
- Polarization Loss from Magnetic Field Noise. ISMRM, Jan (2013)
- Affordable Hyperpolarization by Parahydrogen Induced Polarization. WMIC, Jan (2011)
- Finger Force Sensor Instrumentation Design. IJERSTE. Vol. 3, Issue 3, (2014) 149-155
- LabVIEW based control software for Finger Force Sensor Instrumentation Design. IEEE (2013) 86-91
- Sequential Finger Force Associated with Fatigue. B. Barnes, J.L. Agraz, R.S. Pozos. 11th WCP, 2002. Canada

- Effects of polarization rotation in the detection and tracking of orbiting objects using LabVIEW. IEEE Aerospace (2014)
- Increasing Detection & Tracking Performance of Orbiting Objects in Space using LabVIEW Data Parsing. Submitted IEEE
- Delta-Shaped Piezoelectric Ultrasonic Motor for Two-Dimensional Positioning. Jpn. J. Appl. Phys. 47 (2008) 313-318
- Biometric identification of spatio-temporal keystroke patterns. Pattern Recognition. Submitted

PRESENTATIONS

- Satellite detection. IEEE Aerospace Conferance, Chicago, IL. June 2013
- Hyperpolarization Imaging. Dissertation defense. UC Los Angeles. Los Angeles, CA. Sep 2013.
- Hyperpolarization Imaging. Northwestern Univ. Chicago, IL. June 2009.
- Traveling Wave MRI. Northwestern Univ. Chicago, IL. June 2009.
- Λ (Lambda) Shaped Piezoelectric Linear Motor. Thesis defense. University Park, PA. June 2007.
- Λ (Lambda) Shaped Piezoelectric Linear Motor. 45th ICAT/JTTAS Joint International Smart Actuator Symposium. The Penn Stater Conference Center Hotel, State College, PA. October 2004.
- Piezoelectric Linear Motors. 44th ICAT/JTTAS Joint International Smart Actuator Symposium. The Penn Stater Conference Center Hotel, State College, PA. October 2003.
- Finger Force Sensor Instrumentation Design Using LabView. Thesis defense. San Diego CA. March 2000.

AWARDS AND HONORS

- Button-Waller Fellowship at Penn State 2001-2002
- PREP NIH Fellowship at San Diego State 2000-2001
- REMEC Inc Fellowship, Summer 1998
- Innovation Technology Award. Developed noble instrumentation for carpal tunnel injury quantification, San Diego State University. 2002
- MAERC Fellowship at San Diego State 1998-2000
- 1st Prize: HVDC Converter Station Simulator using a Personal Computer using LabView Semiannual IEEE contest, student chapter. San Diego State University, 1994.

PROFESSIONAL ACTIVITIES

- IEEE – Institute of Electrical E Engineers - member
- Sierra Club - member
- SHPE – Society for Hispanics Professional Engineers - member
- MEP – Minority Engineering Program at San Diego State - member

EXTRACURRICULAR ACTIVITIES

- Martial Arts (Krav Maga orange belt), Rock-Climbing, and Traveling.