

**ALFONSO CUEVAS, Ph.D.**

Associate Professor of Instruction  
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**CITIZENSHIP** United States of America.

**SECURITY** None currently held. Former security clearance Top Secret/SCI.

**SUMMARY OF QUALIFICATIONS**

Dr. Cuevas has 37+ years of electronic product development experience and a detailed understanding of all electronic disciplines. He is a key solution provider for premature electronic product design, development, testing and production issues resulting in quicker time to market.

**EDUCATION**

University of Texas at Austin, Ph.D. in Electrical Engineering, 1990. Dissertation, "The Analysis and Optimization of Electronically-Modulated, Frequency-Tailored Radar Chaff." Emphasis on Applied Electromagnetics and Acoustics. Supervising Professor: Dr. Hao Ling.

University of Texas at Austin, M.S. in (Electrical) Engineering, 1985. Thesis, "Microprocessor Controlled Costas Loop for a Low Cost Global Positioning System Satellite Receiver." Emphasis on Theoretical Electromagnetics and Optics. Supervising Professor: Dr. Arwin A. Dougal.

University of Texas at Austin, B.S. in Electrical Engineering, 1982. Emphasis on Microwave Technology and Mathematics.

**UNIVERSITY OF TEXAS AT AUSTIN COURSE INSTRUCTION**

EE 362K Automatic Control Theory	(Fa20), Su20, Sp20, Su19, Sp19, Sp18, Sp17
EE 313 Linear Systems and Signals	Su20, Sp20, Fa19, Sp19, Fa18, Fa17
EE 319K Intro to Embedded Systems	Sp20, Sp19
EE 411 Circuit Theory	(Fa20), Fa19, Sp18, Fa15
EE 316 Digital Logic Design	Sp18, Fa17, Fa16, Sp16, Fa15
EE 302 Intro to Electrical Engineering	Fa16
EE 306 Intro to Computing	Fa18
EE 438 Electronics	Sp17
EE 361R/379K RF Circuit Design	Sp07, Fa04, Fa02, Fa01
EE 363M Microwave System Design	Sp02, Sp01
EE 360 Special Probs in Elec & Comp Engr	Fa18 (IoT/Navigation), Fa16 (IoT)
EE 464K Senior Laboratory	Faculty Mentor 2001-07, 2017-20

**INDUSTRY EXPERIENCE**

Diarcy Technologies, Inc. – 1997 to Present. Founder and President.

Diarcy Technologies was started in 1990 as a part-time consulting company. Incorporated in the State of Texas in 1997, Dr. Cuevas opened his company on a full-time basis in early 1998. Diarcy Technologies provides electronic product solutions for difficult and complex problems. In addition, Diarcy Technologies manufactures its own line of products.

University of Texas at Austin – 2001 to 2007, 2015-Present. Associate Professor of Instruction. Dr. Cuevas is responsible for lecture and evaluation of undergraduates and first-year graduate students in the Electrical and Computer Engineering Department. See Course Instruction list above. Dr. Cuevas has sponsored projects and mentored students for their Senior Design Project (EE464K) class. To date, Dr. Cuevas has taught 10 different undergraduate courses.

HemoTouch, LLC. – 2006 to Present. Co-founder and Design Engineer.

HemoTouch was started in 2006 and incorporated in the State of Texas to develop a novel medical device for monitoring neonatal conditions immediately after childbirth. A U.S. Patent was applied for in 2006 and received in 2011 on this concept (US 7935061).

Symmetrix/Symtx – 1994 to 1998. Technical and Management Advisor/Director of Engineering. Dr. Cuevas provided technical and management direction for this high-technology start-up engineering firm. While in this position, Dr. Cuevas grew the organization from six engineers to 40+ engineers while revenue grew from \$700K to over \$7M.

Tracor Aerospace, Tracor Applied Sciences, Tracor Flight Systems – 1983 to 1994. Engineer. Dr. Cuevas provided technical direction for advanced material development used for microwave signature control from 6GHz to 94GHz including passive decoy design for next-generation low-observable platforms; passively modulated decoy systems; and microwave and millimeter-wave camouflage design for high-valued land assets. Dr. Cuevas was the lead-designer for the next-generation microwave active countermeasure expendable for the Tri-service Programs. Dr. Cuevas provided detailed electronic warfare analyses using one-on-one and many-on-many simulation codes. Dr. Cuevas developed multivariate clutter classification algorithms to support active sonar clutter reduction techniques. Dr. Cuevas provided technical direction for Tracor Flight Systems' radar hardware simulators, emitters, and RF data recorders (\$12M product line).

## **RECENT PROJECTS (DIARCY TECHNOLOGIES)**

GPS Disciplined Frequency Standards – a low-cost (<\$1K) frequency standard for metrology usage. Provides multiple, simultaneous outputs from audio to 4000MHz while maintaining PPB (parts per billion) accuracy. Design expertise used: RF circuit design, Low-noise analog design, switching power supply design, FPGA/CPLD, mechanical design and packaging.

Oil and Gas Industry Safety Monitoring Equipment – various battery-powered products with four to 72 digital/analog monitoring inputs for fluid/gas flow process control. Design expertise used: low-current design resulting in quiescent currents on the order of 20µA with the system running.

Active GPS Antenna – Circularly-polarized tri-band (L1, L2, and L5) antenna and LNA design. Design expertise used: antenna design, RF design. Achieved very low (0.8dB) noise figure with novel frequency combination technique (single antenna/RF feed).

High-speed RF Data Recorder – Continuous-band RF Data Recorder to capture RF signatures into digital format. Designed for Cellular LTE. Digital data is fed to a Personal Computer for further data analysis. Design expertise used: RF circuit design, low-noise analog design, switching power supply design, lumped-element filter design, FPGA design (with digital filtering), mechanical packaging. Digital data rate throughput (USB): 45MBytes/second, sustained.

Cellular Telephone Base Station Data Recorder – Five-band GSM/PCS/UMTS data recorder to decode BSIC from cellular base stations for identifying co-channel interference. Similar to above but specific to cellular frequencies. Digital data rate throughput (USB): 19MBytes/second, sustained.

RFID Asset Tracking – Various products operating in the ISM bands with applications for anti-loss security devices for personal items such as golf clubs, laptop computers and other personal property; personnel monitoring systems for elderly and home-bound (Alzheimer's) patients and child monitoring.

## **CURRENT RESEARCH**

Internet of Things (IoT) – Marriage between my RF designs, Sensor designs, and Controllers.

Sensor Technology – Research into new sensor technology and applications (RF, ultrasonic, infrared, capacitive, magnetic, pressure, temperature, shock & vibration, etc.)

Instrumentation and Measurement – Research into methods for electronic measurement of physical properties.

Low-current Embedded Controller Designs – Methods to achieve  $\mu\text{A}$  quiescent current consumption.

## **HARDWARE EXPERTISE**

Radio Frequency Circuit Design – All aspects of RF Circuit design up to 4GHz

Embedded Controller Design – Microchip Technology Design Partner, providing innovative embedded designs with extremely low-power consumption for battery operation.

Reverse Engineering – Successfully reversed-engineered many electronic and software products over the years in various electronic/software disciplines.

Concept-to-Hardware – Able to quickly develop new and innovative electronic products from client's conceptual descriptions.

## **SOFTWARE/FIRMWARE EXPERTISE**

C programming language (general), Assembly language (PIC Controller development, ARM Cortex M0/M4), MATLAB scripting, Altera HDL (AHDL), VHDL, Verilog for FPGA and CPLD development, Visual Basic for Applications (VBA).

## **PUBLICATIONS**

A. Cuevas, "The Method of Relative Phase Applied to Wire-Type Scattering Structures," IEEE AP-S International Symposium, Ottawa, Ontario, Canada, June 1991.

A. Cuevas, "Electronically-Modulated Radar Chaff," URSI Radio Science Meeting, Ottawa, Ontario, Canada, June 1991.

A. Cuevas, "The Analysis and Optimization of Electronically-Modulated, Frequency-Tailored Radar Chaff," University of Texas Ph.D. Dissertation, University of Texas at Austin, December 1990.

T.M. Wang, A. Cuevas and H. Ling, "RCS of a Partially Open Rectangular Box in the Resonant Region," IEEE Transactions on Antennas and Propagation, Vol. AP-38, pp. 1498-1504, September 1990.

T.M. Wang, A. Cuevas and H. Ling, "RCS of Open Cavities in the Resonant Region," IEEE AP-S International Symposium, pp. 1038-1041, San Jose, CA, June 1989.

A. Cuevas, "Microprocessor Controlled Costas Loop for a Low Cost Global Positioning System Satellite Receiver," University of Texas Masters Thesis, University of Texas at Austin, May 1985.

## **PATENTS**

US7935061: Method and Apparatus for Monitoring Physiological Conditions, May 2011

US6674292: Microwave corrosion detection systems and methods, January 2004

## **PROFESSIONAL MEMBERSHIPS**

Senior Member, Institute of Electrical and Electronic Engineers (IEEE): Instrumentation and Measurement Society, Microwave Theory and Techniques Society.

## **HOBBIES AND INTERESTS**

Dr. Cuevas holds an Amateur Extra Operating Class license from the FCC for Amateur Radio Operations. His interests are in low-power communications and CW-mode operation. His call sign is AD5MA. Dr. Cuevas is also an avid woodworker. He has a special interest in super fast Pinewood Derby cars.