Vita

Texas Christian University

NAME: Robert Stephen Weis

PLACE OF BIRTH AND DATE: Royal Oak, Michigan on March 12, 1957

EDUCATIONAL BACKGROUND:

B. S. E. E.	U. S. Naval Academy	1979
M. S. (E. E.)	Georgia Institute of Technology	1984
Ph. D. (E. E.)	Georgia Institute of Technology	1987

PROFESSIONAL CERTIFICATIONS:

Licensed as Professional Engineer in the State of Texas, Serial Number 85261

PRESENT RANK: Professor

PREVIOUS TEACHING AND/OR RESEARCH APPOINTMENTS:

a. Part time:

Graduate Teaching Assistant, School of Electrical Engineering
Georgia Institute of Technology, 1984

Graduate Research Assistant, School of Electrical Engineering
Georgia Institute of Technology, 1985-1987

b. Full time:

Assistant Professor, Department of Naval Science
NROTC Unit, Georgia Institute of Technology, 1982-1984

Assistant Professor, Department of Electrical Engineering
U. S. Naval Academy, 1988-1992

PREVIOUS PROFESSIONAL POSITIONS:

U. S. Navy Officer (achieved rank of Lieutenant, USN), 1979-1984

Damage Control Assistant, Repair Officer, and Combat Information Center Officer
USS COMTE DE GRASSE (DD-974), 1979-1982

Assistant Professor, Department of Naval Science
NROTC Unit, Georgia Institute of Technology, 1982-1984

GRANTS RECEIVED:

Sid Richardson Foundation: Science and Engineering Fundamentals for teachers and students, $297K (with J. Kelly)

U.S. Army Aberdeen Testing Center: "Ballistic Shock Measurement System Using Optical Fibers – Implementation," $35.6K (with T. Tayag)

Sid Richardson Foundation: "Hands-on Student Workshops, Teacher Professional Development and Educational Materials Development," $170K (with J. Kelly)

Bell Helicopter: "Permanent Magnet Alternator for Rotary Power Conversion: Proof-of-Concept," $14.7K (with D. Yale)

TCU Vision In Action: "TCU Student Machine Shop," $131.5K (with D. Yale and R. Bittle)

TXU Electric Delivery: "Energy conversion workshops for middle school teachers," $15K annually for past four years (with R. Bittle)

Coppell Independent School District: "Science teacher professional development: structures for learning," $40K (with J. Kelly)

Sid Richardson Foundation: Institute of Mathematics, Science, and Technology Education funding, $25K (with J. Kelly)

RBI – Gearhart: "A rugged, accurate, inexpensive, inclinometer for measurement-while-drilling systems," $15K

Lockheed Martin (Fort Worth): "Professional Development for Math and Science Teachers," $10K (with J. Kelly)

Lockheed Martin Missiles and Fire Control (Grand Prairie): "Math and Science Mini-University for 4th Graders," $5K (with J. Kelly)

Bell Helicopter-Textron: "An optical fiber telemetry link in a ARINC429 system," $6.3K

CiDRA Corporation: "Interferometric demodulation and noise," 2001-2002, $49.3K (with T. Tayag)

CiDRA Corporation: "In-well seismic sensors based on optical fiber Bragg gratings," 2000-2001, $49.3K

Texas Higher Education Coordinating Board (Advanced Technology Program): Supplemental grant for high school teacher support, 2000, $8.1K

Texas Higher Education Coordinating Board (Advanced Technology Program): Supplemental grant for high school teacher support, 1999, $8.1K

Texas Higher Education Coordinating Board (Advanced Technology Program): "An optical fiber Bragg grating based borehole seismic detection system," 1998-2000, $104K (plus $20K in-kind from CiDRA Corp. and $38K in-kind from RockBit International, Inc.)

Texas Higher Education Coordinating Board (Advanced Technology Program): "MWD telemetry system for coiled tubing drilling using optical fiber grating modulators downhole," 1996-1997, $96K (plus $48K in-kind from RockBit International, Inc.)

Outdoor Technologies Group: "Continued testing of plastic optical fiber coatings," 1997, $1.6K

NSF Engineering Faculty Internship (co-funded by RockBit International, Inc.): "An Optical-Fiber-Grating Seismic Detector," 1994, $20K

USN - ASEE Summer Faculty Research Fellow: "Optical Fiber Sensor Development," 1993, $12K

John Fluke Manufacturing Company, Inc. University Donation Program: "Instrumentation for Undergraduate Engineering Electrical Laboratory," 1993, $65K

NSF Instrumentation for Laboratory Improvement Grant: "A Fiber Optics Instructional Laboratory," 1989-1991, $76K

REFEREED PUBLICATIONS:

(*proprietary scholarship is listed in a subsection below*)

R. S. Weis, "Using an Arduino to Measure Frequency Response and Current-Voltage Device Characteristics in Electronics Labs," Proceedings of the 2009 ASEE Gulf Southwest Conference, (http://asee-gsw.tulane.edu/pdf/using-an-arduino-to-measure-frequency-response-and-current-voltage-device-characteristics-in-electronics-labs.pdf), April 2014

P. Kumar, A. Thomas, R. S. Weis, and T. J. Tayag, "Digital processing of an Interferometric velocimeter for ballistic shock measurement," Proceedings of SPIE Vol. 7432, Optical Inspection and Metrology for Non-Optics Industries, Editors: P. S. Huang, T. Yoshizawa, and K. G. Harding, 10 September 2009.

E. Moen and S. Weis, "Converting a Porsche 914 to an Electric Vehicle," in Proceedings of the 2009 ASEE Gulf Southwest Conference, March 2009.

A. Thomas and S. Weis, "Fiber Optic Vibrometer for Measuring Ballistic Shock," in Proceedings of the 2009 ASEE Gulf Southwest Conference, March 2009.

S. Weis, M. Yakubovsky, B. Bittle, R. Cote, and J. Kelly, "Integrating Engineering Ideas Into High School and Middle School Curricula," in Proceedings of the 2009 ASEE Gulf Southwest Conference, March 2009.

J. Kelly and S. Weis, "An Institute for Inquiry," *Science and Children*, vol. 42, no. 4, pp. 45-47, January 2005.

B. T. Ludington and R. S. Weis, "Macrobend loss reduction of a fiber interferometer using graded-index multimode fiber," in *15th International Conference on Optical Fiber Sensors*, pp. 531-534, May 2002. (also listed in section 14.e)

R. S. Weis and B. L. Bachim, "Source noise induced resolution limits of interferometric fiber Bragg grating sensor demodulation systems" *Measurement Science and Technology*, vol. 12, pp. 782-785, May 2001.

R. S. Weis and B. L. Bachim, "Source noise limits of interferometric phase-sensitive detection of fiber Bragg grating sensors," in *14th International Conference on Optical Fiber Sensors*, vol. 4185, SPIE, pp. 74-77, October 2000. (also listed in section 14.e)

R. S. Weis, B. L. Bachim, B. M. Beadle, and M. Gearhart, "Optical fiber telemetry systems for measurement-while-drilling applications" *Optical Engineering*, vol. 39, no. 6, 1591-1596, June 2000.

R. S. Weis, "A hands-on microcontroller project using mobile robots," *Computers in*

Education Journal, pp. 41- 44, April 1999.

B. M. Beadle and R. S. Weis, "Longitudinal vibrations of a silica fiber segment characterized using a fiber Bragg grating," *IEEE Trans. on Ultrasonics, Ferroelectrics, and Frequency Control* vol. 45, no. 4, 1100-1104, July 1998.

R. S. Weis and B. M. Beadle, "MWD telemetry system for coiled-tubing drilling using optical fiber grating modulators downhole," in *12th International Conference on Optical Fiber Sensors*, vol. 16, OSA Technical Digest Series (Optical Society of America, Washington, DC, 1997), pp. 416-419. (also listed in section 14.e)

B. M. Beadle, R. S. Weis, and C. A. Norwood, "Radial strain-induced attenuation in plastic optical fiber," *Optical Engineering*, vol.35, no. 6, pp. 1696-1699, June 1996.

R. S. Weis, A. D. Kersey, and T. A. Berkoff, "A four-element fiber grating sensor array with phase sensitive detection," *Photonics Technology Letters*, vol. 6, no. 12, December 1994, pp. 1469-1472.

R. S. Weis and A. D. Kersey, "Spectrally selective fiber interferometric filters for wavelength selection in fiber ring lasers," Proceedings of the *Conference on Optical Fiber Communication/ International Conference on Integrated Optics and Optical Fiber Communication*, San Jose, CA, February 1993, pp. 23-24. (also listed in section 14.e)

R. S. Weis, A. D. Kersey, and I. N. Duling, III, "Interferometric measurements of linewidth and phase noise of an Er-doped fiber ring laser," Proceedings of the *Eighth International Conference on Optical Fiber Sensors*, Monterey, CA, January 1992, pp. 10-13. (also listed in section 14.e)

R. S. Weis and A. D. Kersey, "Fiber optic two-beam interferometer fringe amplitude recovery using laser frequency control," *Applied Optics*, vol. 31, no. 16, pp. 2964-2966, June 1992.

R. S. Weis, "Visualization of modal irradiance patterns in an optical fiber," *IEEE Transactions on Education*, vol. 35, no. 2, pp. 109-111, May 1992.

R. S. Weis, "Photoelastic coefficients of lithium niobate," Section 2.3 in Properties of Lithium Niobate, INSPEC (Institute of Electrical Engineers), London, 1989, pp. 34 - 37.

R. S. Weis, "Pyroelectric coefficient of lithium niobate," Section 4.6 in Properties of Lithium Niobate, INSPEC (Institute of Electrical Engineers), London, 1989, p. 127.

R. S. Weis, "Turbo Pascal graphics procedures for IBM-PC," *Computers in Education Journal*, vol. IX, no. 3, pp. 24-30, July-September 1989.

R. S. Weis and T. K. Gaylord, "Magneto-optic multilayered memory structure with a birefringent supersaturate: A rigorous analysis," *Applied Optics*, vol. 28, no. 10, pp. 1926-1930, May 1989.

R. S. Weis and T. K. Gaylord, "Fabry-Perot/Solc filter with distributed Bragg reflectors: A narrow-band electro-optically tunable spectral filter," *Journal of the Optical Society of America A*, vol. 5, no. 9, pp. 1565-1570, September 1988.

R. S. Weis and T. K. Gaylord, "Electromagnetic transmission and reflection characteristics of anisotropic multilayered structures," *Journal of the Optical Society of America A*, vol. 4, no. 9, pp. 1720-1740, September 1987.

R. S. Weis and T. K. Gaylord, "Lithium niobate: Summary of physical properties and crystal structure," *Applied Physics A*, vol. 36, no. 4, pp. 191-203, August 1985. (*invited paper*)

PATENTS:

F.D. Shirley, V. P. Chiarito, S.C. Woodson, P. Walter, S. Weis, “Portable system for measuring dynamic pressure in situ and method of employment,” U. S. Patent 7,266,986, September 11, 2007.

R. S. Weis, “Optical fiber modulation and demodulation system,” U. S. Patent 5,898,517, April 27, 1999.

R. S. Weis, “Optical fiber modulation and demodulation system,” U. S. Patent 5,808,779, September 15, 1998.

R. S. Weis, “Optical fiber modulation and demodulation system,” U. S. Patent 5,675,674, October 7, 1997.

PROPRIETARY WORK:

S. Weis and R. Robért, “Improving MEMS gyro performance – a continuing investigation,” submitted to the Gearhart Companies, August 7, 2012.

S. Weis and A. Shkurti, “Improving MEMS gyro performance – a continuing investigation,” submitted to the Gearhart Companies, August 15, 2011.

S. Weis, “Improving MEMS gyro performance – a continuing investigation,” submitted to the Gearhart Companies, August 9, 2010.

S. Weis, “Improving MEMS gyro performance,” submitted to the Gearhart Companies, August 19, 2009.

M. Friday, S. Weis, and D. Yale, “Permanent Magnet Alternator Design,” submitted to Bell Helicopter Textron, September 2008.

A. Thomas, P. Kumar, S. Weis and T. Tayag, “Ballistic shock measurement system using optical fibers (Phase 2),” submitted to U.S. Army Aberdeen Test Center, August 2008.

K. A. Nguyen and R. S. Weis, “Development and testing of an inexpensive inclinometer for measurement-while-drilling,” submitted to Marvin Gearhart and GeoGyro, May 2005.

R. S. Weis, “Effect of temperature on the dc offset signals in the Optisense lithium niobate voltage sensor,” submitted to Optisense Networks Inc., August 2004.

R. S. Weis, “Coherent Rayleigh noise in a fiber Bragg array,” final report submitted to CiDRA Corporation and Weatherford Completion Systems, July 2003.

K. Nguyen and R. S. Weis, “Survey of high-temperature inclinometers,” submitted to RBI-Gearhart, November 2003.

R. S. Weis, “Coherent Rayleigh noise in a fiber Bragg array,” report submitted to CiDRA Corporation, July 2001.

R. S. Weis, C. A. Lovell, and S. Monaghan, “Seismic sensor progress report: Geohydrophone sensitivity,” submitted to CiDRA Corporation, September 2000.

R. S. Weis, B. L. Bachim, C. A. Lovell, and S. Monaghan, “Seismic sensor progress report: Fiber beam sensor, Geohydrophone, and Reluctance sensor,” submitted to CiDRA Corporation, July 2000.

R. S. Weis, J. R. Dunphy, C. J. Chestnut, “Fiber beam accelerometer/seismometer,” Patent disclosure (1999).

R. S. Weis, A. D. Kersey, J. R. Dunphy, S. Knudsen, and F. X. Bostick, "Geohydrophone," patent disclosure (1999).

R. S. Weis and B. L. Bachim, "Cochlea-like seismic vibration sensors," submitted to CiDRA Corporation, February 1999.

R. S. Weis, "Borehole background seismic noise levels: A brief survey," submitted to CiDRA Corporation, February 1999.

R. S. Weis, "Geophone based on elliptical ring springs," Patent disclosure (1998).

NON-REFEREED PUBLICATIONS

S. Weis, "Teaching electrical engineering fundamentals – A new (slightly modified approach)," August 8, 2013.

R. S. Weis, "Review of lithium niobate structure and properties," delivered to Optisense Networks, Inc., May 2004.

R.R. Bittle, R. S. Weis, B. Bittle, D. Yale, "Summer workshop experiences for middle school teachers and students," Proceedings of the 2003 ASEE Gulf-Southwest Conference, March 2003.

V. Chiarito, S. Woodson, P. Walter, and S. Weis, "A mechanical, pneumatic system to perform in situ calibration of blast pressure transducers," Proceedings of the 73rd Shock and Vibrations Conference, November 2002.

A. Bertapelle, J. W. Millward, S. Nadimi, R. S. Weis, and B. T. Ludington, " Utilizing benefits of fiber optics without modifications of legacy systems," Proceedings of the 58th American Helicopter Society Annual Forum, June 12, 2002.

M. A. Stephens, B. T. Ludington, E. A. Green, R. S. Weis, and W. E. Williamson, "The homicidal chauffeur problem: a hands-on autonomous mobile robot exercise for a controls systems class," *Proceedings of the 2001 ASEE Gulf Southwest Annual Conference*, March 2001. (awarded first place in student paper division)

B. T. Ludington and R. S. Weis, "A hands-on introduction to engineering design using Lego™ robots," *Proceedings of the 2001 ASEE Gulf Southwest Annual Conference*, March 2001. (awarded third place in faculty paper division)

R. S. Weis, "A hands-on microcontroller project using mobile robots," Proceedings of *ASEE Gulf-Southwest 1999 Annual Conference*, CD-ROM, (1999).

B. L. Bachim (and R. S. Weis – Advisor), "Design and testing of a simple optical fiber telemetry link for use in rugged environments," in Proc. Of *International Telemetering Conference*, 34, 61-68 (1998). – *awarded best undergraduate paper*

B. L. Bachim and R. S. Weis, "Optical fiber telemetry link for rugged environments," Proceedings of *ASEE Gulf-Southwest 1998 Annual Conference*, pp. 47-50, (1998).

Book review of Wave Transmission and Fiber Optics by Paul Diament, *IEEE Transactions on Education*, vol. 35, no. 2, p. 176, May 1992.

PAPER PRESENTATIONS AND WORKSHOPS

B. T. Ludington and R. S. Weis, “A hands-on introduction to engineering design using Lego™ robots,” presented at the 2001 ASEE Gulf Southwest Annual Conference, March 2001.

R. S. Weis, B. L. Bachim, and S. Monaghan, “Seismic sensor testing results” presented November 4, 1999 at CiDRA Seismic Workshop, Houston, TX.

R. S. Weis, B. L. Bachim, and S. Monaghan, “Structure analysis and testing results for seismic sensors” presented July 28, 1999 at CiDRA Seismic Workshop, Wallingford, CT.

R. S. Weis and B. L. Bachim, “Seismic sensing ideas,” presented March 17, 1999 at CiDRA Seismic Workshop, Wallingford, CT.

R. S. Weis, “A hands-on microcontroller project using mobile robots,” presented March 7, 1999 at ASEE Gulf-Southwest Annual Conference in Dallas, Texas. (Paper was included in Proceedings CD-ROM).

R. S. Weis, B. M. Beadle, and B. L. Bachim, “A rugged telemetry system: Testing results and design improvements,” presented at the Fourth Pacific Northwest Fiber Optic Sensor Workshop, Troutdale, Oregon, May 7, 1998.

B. L. Bachim and R. S. Weis, “Optical fiber telemetry link for rugged environments,” ASEE Gulf-Southwest Annual Conference, New Orleans, LA, March 25, 1998.

R. S. Weis and B. M. Beadle, “A rugged telemetry system for coiled-tubing earth drilling,” at the Third Pacific Northwest Fiber Optic Sensor Workshop, Troutdale, Oregon, May 6, 1997.

B. M. Beadle, R. S. Weis, and C. A. Norwood, "Radial strain-induced attenuation in plastic optical fiber," ASEE Gulf-Southwest Annual Conference, San Antonio, TX, March 1996.

R. S. Weis and S. Sherwood, "A sophomore composition class for engineering and science majors," ASEE Gulf-Southwest Annual Conference, San Antonio, TX, March 1996.

R. S. Weis and B. M. Beadle, "Inexpensive plastic optical fiber strain sensor," at the Annual Meeting of the Optical Society of America, Dallas, TX, October 3, 1994.

R. S. Weis, "An introduction to optical fiber sensors with an emphasis on fiber Bragg gratings," IEEE Fort Worth Section meeting, May 4, 1994.

R. S. Weis, M. J. Marrone, and A. D. Kersey, “Frequency-division based polarization diversity scheme for overcoming signal fading in an interferometric sensor,” (presented by A. D. Kersey), Annual Meeting of the IEEE Lasers and Electro-Optics Society, Boston, MA, October 1990.

R. S. Weis, "Introduction to optical fibers: a hands-on workshop," Spring Meeting of the ASEE Mid-Atlantic Section, Annapolis, Maryland, April 27-28, 1990.