



Formerly University of Missouri-Rolla

STEVE E. WATKINS

Missouri University of Science and Technology
Department of Electrical & Computer Engineering
121 EECH, 301 West 16th Street
Rolla, Missouri 65409-0040
(573) 341-6321 steve.e.watkins@ieee.org
<http://www.Linkedin.com/in/WatkinsSteveE>

PROFESSIONAL INTERESTS:

Smart Sensor Systems, Fiber Optics, Imaging, Engineering Education, and Pre-college Education.

DEGREES:

Ph.D. in Electrical Engineering: The University of Texas at Austin, August 1989;
3.96/4.00 G.P.A.; Emphasis Area: Solid-State Electronics
Dissertation Title: "Electrical Parameter Degradation of Silicon Photodiodes Induced by
Nanosecond 1.06 μm Laser Pulses." Advisor: Michael F. Becker
M.S. in Electrical Engineering: University of Missouri-Rolla (UMR), May 1985;
4.00/4.00 G.P.A.; Emphasis Area: Electromagnetics
"A Study of Shadow Contrast for a Grating." Advisor: Jerome Knopp
B.S. in Electrical Engineering: University of Missouri-Rolla, July 1983; Summa Cum Laude;
4.00/4.00 G.P.A.; Communication Minor in Speech and Media Studies
Honors Program – Research in the Electro–Optics Laboratory

ACADEMIC AND ADMINISTRATIVE EXPERIENCE AT CURRENT INSTITUTION:

Sept. 2004 - Present	Professor, Department of Electrical & Computer Engineering (ECE), Missouri S&T (MoS&T), formerly University of Missouri-Rolla (UMR)
June 2020 - Present	Interim Chair of ECE Department, ECE, MoS&T
Jan. 2005 - June 2016	Associate Chair of EE Undergraduate Studies, ECE, MoS&T
Sept. 1996 - Aug. 2004	Associate Professor, Department of Electrical Engineering, UMR
Sept. 1989 - Aug. 1996	Assistant Professor, Department of Electrical Engineering, UMR
June 1986 - July 1986	Lecturer, Department of Electrical Engineering, UMR
Aug. 1983 - Dec. 1983	Teaching Assistant, Department of Electrical Engineering, UMR

OTHER ACADEMIC, RESEARCH, AND PROFESSIONAL EXPERIENCE:

Sept. 1991 - Present	Director, Applied Optics Laboratory (APOL), MoS&T
Sept. 2002 - Present	Consultant, Savant LLC/Core Memory Circuits LLC
Summers 2019 & 2018	Fellow, Air Force Research Lab Summer Faculty Fellowship Program, USAF Academy, CO
July 2016 - June 2017	Distinguished Visiting Professor, Department of Electrical & Computer Engineering, USAF Academy, CO
May 2013 - June 2013	Fellow, Summer Institute in Israel Program
June 2005 - Aug. 2005	Faculty-Member-in-Residence, Washington Internships for Students of Engineering (WISE) Program, Washington, D.C.
Jan. 2004 - Dec. 2004	IEEE-USA Congressional Fellow/Legislative Staff, U.S. Congress, Office of Congressman Dana Rohrabacher (CA 46 th), Washington, D.C.
July 1992 - June 2000	Research Associate, Intelligent Systems Center, UMR
Nov. 1989 - June 1991	Visiting Research Physicist, Phillips Laboratory, USAF Kirtland Air Force Base, Albuquerque, NM
Sept. 1988 - Apr. 1989	Research Assistant, ECE Department The University of Texas at Austin, Austin, Texas
Oct. 1985 - Apr. 1986	Visiting Scholar, Musashino Electrical Communication Laboratories Nippon Telegraph and Telephone Corporation, Tokyo
June 1984 - Aug. 1984	Research Assistant, Thomas J. Watson Research Center IBM Corporation, Yorktown Heights, New York

SELECTED ACTIVITIES:

Campus and Community

Academy of ECE, Missouri S&T – Board of Directors (2015-20)
Faculty Advisor, MoS&T Gamma Theta Chapter of HKN (1992-Present)
Faculty Advisor, MoS&T Beta Chapter of Tau Beta Pi (Advisor 2014-Present)
Faculty Advisor, MoS&T Aerospace and Electronic System Chapter of IEEE (2007-Present)
Faculty Advisor, MoS&T Student Chapter of Toastmasters (1991-2019)
Friends of the Baptist Student Union, Missouri S&T – Board of Directors (2013-16)
MoS&T Robotics Pre-College Summer Camp, Co-Coordinator 2021, 2019, 2018, 2017, 2016, 2015, 2014, 2012, 2011, 2010, 2009, 2008, & 2007
Amateur Radio, Callsign W0WMO
School Board for Dent-Phelps R-3 School Salem, MO (2009-12, 2007-09, 2006-07, 2003-06, & 2001-03) President 2011-12, 2010-11, 2009-10, & 2008-09 & Vice-President 2007-08
Officer, Toastmasters, District 8 Gov. (1994-95), D8 Lt. Gov. of Education & Training (1993-94), D8 Lt. Gov. Marketing (1992-93) D23 Area Gov. (1990- 91), & UMR Club Pres. (1991-92).

American Society for Engineering Education (ASEE)

Board of Directors, ASEE, Zone III Chair (2015-17) & Chair-Elect (2014-15)
Officer, ASEE Electrical and Computer Engineering Division, Immediate Past Chair (2020-21), Chair (2019-20), Chair-Elect (2018-19) & Secretary-Treasurer (2016-17)
Officer, Midwest Section of ASEE, Chair (2008-09), & Chair-Elect (2007-08)
Campus Representative for ASEE, MoS&T (2005-Present)

Institute of Electrical and Electronics Engineers (IEEE)

Member, IEEE Ethics and Member Conduct Committee (2020 & 2019)
Educational Activities Board, Member (2018)
Board of Governors, IEEE Education Society, Vice-President of Educational Activities & Awards (2019-20) & Director-at-Large (2016-18)
Board of Governors, IEEE, Intelligent Transportation Systems Society, Director (2005-08)
Board of Governors, IEEE-Eta Kappa Nu, ECE Honor Society, President and BOG Chair (2018), Past President (2019), President-Elect (2017), & HKN Director-at-Large (2004-07)
Editor-in-Chief, IEEE-HKN, ECE Honor Society, *The Bridge Magazine* (2020-21 & 2013-17)
Committees, IEEE-HKN/HKN, Nominations & Appointments (2020 & 2019), Election Tellers (2014 & 2013), Strategic Planning (2018-19 & 2014), & Advisor Recognition (2003-09)
Officer, Region V of IEEE, Awards Chair (2014-15), Government Activities Chair (2012-13), Student Activities Coordinator (2008-11) & North Area Chair (2006-08)
Officer, St. Louis Section of Institute of Electrical and Electronics Engineers (IEEE), Chair (2003), Vice-Chair (2002), Secretary (2001) & Treasurer (2000)
Member, IEEE EAB Faculty Resources Committee. Chair (2020) & Member (2019)
Member, IEEE-USA Awards and Recognition Committee (2014-2015)
Member, Committee on Transportation and Aerospace Technology Policy, IEEE-USA (2003-08)
Member, MGA Awards and Recognition Committee (2014-15), MGA Admission and Advancement Committee (2014-15), & MGA Student Activities Committee (2008-11)

Conference Student Competition Activities

Student Ethics Competition Chair, 2021, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008 & 2007 Region V IEEE Annual Conferences
Student Ethics Competition Committee, IEEE Ethics and Member Conduct Committee (2004)
General Chair, 2009 International IEEE Intelligent Transportation Systems Conference
Special Sessions Chair, 2007 International IEEE Intelligent Transportation Systems Conference
Publicity Co-Chair, 2005 International IEEE Intelligent Transportation Systems Conference
Exhibits Chair, 2004 International IEEE Intelligent Transportation Systems Conference
Technical Program Chair, 2005 IEEE GLOBECOM Conference, IEEE Communications Society
Technical Program Chair, ECE Division Program for 2018 ASEE Conference
General Chair, 2012 ASEE Midwest Conference
Host Faculty Advisor, 2007 Eta Kappa Nu Student Leadership Conference

Other Activities

Officer, Greater St. Louis Section of the Optical Society of America (OSA), President (1996-97 & 1994-95), Vice-President (1993-94), & Secretary (1992-93)
Member, Senior Member Subcommittee, SPIE Membership Committee (2010-2012)
Member, SPIE Membership Committee (2011-2013)
Student Officer, UMR IEEE Student Branch: President (1982-83); Vice President (1981-82)
Student Officer and Charter Member, UMR Student Toastmasters Club: President (1983)

Invited Speaker (Selected Events)

Invited Speaker (Selected): Tau Beta Pi Convention, Denver, Colorado (2018), Eta Kappa Nu Student Leadership Conference (2018 & 2004), IEEE-Boeing NextTech Conference, St. Louis, Missouri (2015), IEEE International Sections Congress (2008 & 2005), IEEE-USA Leadership Conference (2005)
Campus Guest Speaker for Student Groups: Baylor University, University of Colorado Boulder, Colorado State University, SIU-Carbondale, St. Louis University, Rose-Hulman Institute of Technology, University of California Santa Cruz, The University of Texas at Austin, Tufts University, Valparaiso University, University of Missouri-Columbia.

AWARDS:

Fellow (2018) and Senior Member (2009) of SPIE; Senior Member of IEEE (1998)
Societies: Tau Beta Pi, IEEE-Eta Kappa Nu (IEEE-HKN), Sigma Xi, & Phi Kappa Phi
Jim Watson Student Professional Awareness Achievement Award from IEEE-USA - 2016 Recipient
“For sustained contributions to the professional development of students and for outreach to precollege students“
RAB Achievement Award from IEEE Regional Activities Board – 2004 Recipient
“For the creation of the student ethics contest which inspired the development of the IEEE SEC”
IEEE-USA Congressional Fellowship – 2004 Recipient
Region 5 IEEE Awards: Outstanding Member (2005) & Outstanding Engineering Educator (1999)
St. Louis IEEE Section Awards: Member (2009 & 2005), Educator (1996), & Young Eng. (1994)
ASEE Midwest Section Best Paper Award– 2017 First-Place Paper & 2012 Second-Place Paper
ASEE Midwest Section Outstanding Service Award– 2012 Recipient
Toastmasters: Presidential Citation for University Student Outreach – 2003 Recipient
Academy of ECE, Missouri S&T – Elected 2013
MoS&T Award Recipient: Faculty Service (2016 & 2010), Distinguished Advisor (2015), Transfer Student Advisor (2007), Faculty Excellence (2000), & Outstanding Teacher (2002 & 1995)
Miner Alumni Awards: Outstanding Advising (1999) & Excellence in Teaching (1995)
Outstanding Young Electrical Engineer Award Program (National HKN) - 1993 Finalist
Alton B. Zerby Award to the Outstanding EE Student (National HKN) – 1983 Recipient
A.P. Green Award to the Outstanding Undergraduate at UMR – 1983 Recipient
UMR Undergraduate Research Award (Sigma Xi) – 1983 Recipient
APEX Award of Excellence: Annual Report Category – 2020 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Author & N. Ostin & S. Bersani– Managing Editors)
APEX Award of Excellence: Covers Category – 2018 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Editor-in-Chief & N. Ostin – Managing Editor)
APEX Award of Excellence: Most Improved Category – 2017 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Editor-in-Chief & N. Ostin – Managing Editor)
APEX Award of Excellence: Writing Series Category – 2016 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Editor-in-Chief & N. Ostin – Managing Editor)
APEX Award of Excellence: Print Media – Special Purpose Category – 2015 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Editor-in-Chief & N. Ostin – Managing Editor)
APEX Award of Excellence: Most Improved Category – 2014 Recipient IEEE-HKN *The Bridge Magazine* (S. E. Watkins –Editor-in-Chief & N. Ostin – Managing Editor)

PUBLICATIONS AND PAPERS:

(Total Publications: 1 Patent, 3 Book Chapters, 51 Archival Papers, and 94 Other Papers)

See Google Scholar: search "Steve E. Watkins" (scholar.google.com)

Patent

R. Dua, S. E. Watkins, and D. C. Wunsch, *Neural Network Demodulation for an Optical Sensor*, U.S. Patent No. 7,603,004 [Issued 13 October 2009]. (www.google.com.ar/patents/US7603004)

Guest Editor

Guest Editor for Special Issue on "Connecting the World with Amateur Radio," *IEEE-HKN The Bridge Magazine*, Volume **115**(2), 2019 (hkn.ieee.org).

Guest Co-Editor for Special Issue on Trends in Pre-college Engineering & Technology Education, *International Journal of Engineering Education*, Volume **23**(1 & 5), 2007 (www.ijee.ie/).

Guest Editor for Special Issue on Resources for Pre-college Education, *Journal of STEM Education: Innovations and Research*, Volume **5**(3/4), December 2004 (www.jstem.org).

General Papers

S. E. Watkins, "2018 Annual Report for IEEE-Eta Kappa Nu," *IEEE-HKN The Bridge*, **115**(1), 20-26, (2019).

S. E. Watkins, "Into the Second Century of Eta Kappa Nu," *IEEE-HKN THE BRIDGE Magazine*, **114**(3), 26-27, 2018.

J. K. Nagel and S. E. Watkins, "Design of a Bio-Inspired Optical Current Transducer," *IEEE-HKN The Bridge*, **112**(1), 34-42, (2016).

D. C. Macke, S. E. Watkins, and T. Rehmeier, "Creative Interdisciplinary UAV Design," *IEEE Potentials*, **33**(1), 12-15, (2014).

S. E. Watkins, "IEEE-HKN: The Electrical and Computer Engineering Honor Society," *IEEE Potentials*, **31**(4), 19-21, (2012).

J. K. Stroble (Nagel), S. E. Watkins, and R. B. Stone, "Biology-Inspired Sensor Design," *IEEE Potentials*, **28**(6), 19-24, (2009).

J. K. Stroble (Nagel), R. B. Stone, and S. E. Watkins, "An Overview of Biomimetic Sensor Technology," *Sensor Review*, **29**(2), 112-119, (2009).

S. E. Watkins, "Sensor Instrumentation to Monitor Smart Bridges," *SPIE Newsroom*, DOI: 10.1117/2.1200708.0826, August 2007. (website: spie.org).

C. Contant and S. E. Watkins, "Commercial Space: America's Vision for Space Exploration – Public Policy Roundtable," *Aerospace America: AIAA Bulletin*, September 2004, pp. B10-B11.

P. Clark, J. Boriniski, M. Gunther, S. Poland, D. Wigent, and S. E. Watkins, "Modern Fibre Optic Sensors," *Smart Materials Bulletin*, Elsevier Science Ltd., 8-11, June 2001. (newsletter).

Book Chapters

R. Luechtefeld and S. E. Watkins, "Balancing Theory and Practice in Higher Education," in *Perspectives on Higher Education in the Digital Age*, edited by M. F. Beaudoin (Nova Science Publishers, Hauppauge, NY, 2006), Chap. 15, 247-258.

R. H. Hall, S. E. Watkins, and V. M. Eller, "A Model of Web Based Design for Learning," in *Handbook of Distance Education*, edited by M. G. Moore and B. Anderson (Erlbaum, Mahwah, NJ, 2003), Chap. 25, 367-375. (*The book received the Charles E. Wedemeyer Award for the Outstanding Book of 2003, Distance Learning Community of Practice, University Continuing Education Association.*)

- R. H. Hall, S. E. Watkins, R. L. Davis, A. Belarbi, and K. Chandrashekhara,, “Design and Assessment of Web-Based Learning Environments: The Smart Engineering Project and the Instructional Software Development Center at the University of Missouri-Rolla” in *Cybereducation: The Future of Long-Distance Learning*, edited by L. R. Vandervert and L. V. Shavinina, and R. A. Cornell (Mary Ann Liebert, Inc., Larchmont, NY, 2001), Chap. 7, 137-156.

Refereed Papers

- S. Jothibas, T. Du, S. Anandan, G. Dhaliwal, R. Gerald, S. E. Watkins, K. Chandrashekhara, and J. Huang, “Spatially Continuous Strain Monitoring using Distributed Fiber Optic Sensors Embedded in Carbon Fiber Composites,” *Opt. Eng.*, **58**(7), 072004, (2019).
- A. Kaur, S. Anandan, L. Yuan, S. E. Watkins, K. Chandrashekhara, H. Xiao, and N. Pham, “Strain Monitoring of Bismaleimide Composites using Embedded Microcavity Sensor,” *Opt. Eng.*, **55**(3), 037102, (2016).
- A. Kaur, S. E. Watkins, J. Huang, L. Yuan, and H. Xiao, “Microcavity Strain Sensor for High Temperature Applications,” *Opt. Eng.*, **53**(1), 017105, (2014).
- A. Heckman, J. L. Rovey, K. Chandrashekhara, S. E. Watkins, D. S. Stutts, A. Bannerjee, and R. S. Mishra, “Structural Health Monitoring Data Transmission for Composite Hydrokinetic Turbine Blades,” *Advanced Shipping and Ocean Engineering*, **2**(2), 50-59, (2013).
- D. Erdos, A. Erdos, and S. E. Watkins, “An Experimental UAV System for Search and Rescue Challenge,” *IEEE Aerospace and Electronics Systems Magazine*, **28**(5), 32-37, (2013).
- K. N. Rodhouse, B. Cooper, and S. E. Watkins, “Programming for Pre-college Education using Squeak Smalltalk,” *Computers in Education Journal*, **21**(2), 101-111, (2011).
- S. E. Watkins, B. A. Konz, R. Dua, A. Belarbi, and D. C. Wunsch, “Smart Truss for Education,” *Journal of Intelligent Material Systems and Structures*, **22**(4), 317-326, (2011).
- J. W. Fonda, M. J. Zawodniok, J. Sarangapani, and S. E. Watkins, “Adaptive Distributed Fair Scheduling for Multiple Channels in Wireless Sensor Networks,” *International Journal of Distributed Sensor Networks*, **5**(6), 824-833, (2009).
- K. Mitchell, W. Ebel, and S. E. Watkins, “Low-power Hardware Implementation of Artificial Neural Network Strain Detection for Extrinsic Fabry-Perot Interferometric Sensors under Sinusoidal Excitation,” *Opt. Eng.*, **48**(11), 114402, (2009).
- S. E. Watkins, M. A. Huggans, and S. J. Bentley, “Pre-college Outreach at a Technical Conference,” *Int. J. of Engineering Education*, **25**(3), 436-443, (2009). Special Issue on Pre-College Outreach
- T. H. Jones, D. Apel, S. E. Watkins, and R. H. Moss, “The Effects of Mine Fog and Vibration Sources on an Experimental Ground Convergence Monitor,” *Int. J. of Mining, Reclamation and Environment*, **23**(4), 261-273, (2009).
- R. Luechtefeld, D. Baca, and S. E. Watkins, “Training for Self-Managed Student Teams,” *Int. J. of Engineering Education*, **24**(6), 1139-1147, (2008).
- J. W. Fonda, M. j. Zawodniok, J. Sarangapani, and S. E. Watkins, “Optimized Energy-Delay Sub-network Routing Protocol Development and Implementation for Wireless Sensor Networks,” *Smart Mater. Struct.*, **17**(4), 045015, (2008).
- D. Apel, R. H. Moss, S. E. Watkins, T. H. Jones, and B. Gray, “Wall-Movement Monitoring using a High-Resolution Target Movement Monitoring System,” *SME Transactions, Society for Mining, Metallurgy, and Exploration*, **322**, 57-60, (2007).

- D. Apel, B. Gray, R. H. Moss, S. E. Watkins, and T. H. Jones, "Development and Laboratory Trials of the Light-Based High-Resolution Target Movement Monitor for Monitoring Convergence at Underground Mines," *Journal of Geotechnical and Geoenvironmental Engineering (ASCE)*, **133**(9), 1167-1171, (2007).
- K. Mitchell, S. E. Watkins, J. W. Fonda, and J. Sarangapani, "Embeddable Modular Hardware for Multi-Functional Sensor Networks," *Smart Mater. Struct.*, **16**(5), N27-N34, (2007). (Technical Note)
- A. M. Abdi and S. E. Watkins, "Strain Sensor Calibration using Extrinsic Fabry-Perot Interferometric Sensors," *Opt. Eng.*, **46**(10), 104402, (2007).
- A. M. Abdi and S. E. Watkins, "Demodulation of Fiber-Optic Sensors for Frequency Response Measurement," *IEEE Sensors Journal*, **7**(5), 667-676, (2007).
- S. E. Watkins, J. W. Fonda, and A. Nanni, "Assessment of an Instrumented Reinforced-Concrete Bridge with Fiber-Reinforced-Polymer Strengthening," *Opt. Eng.*, **46**(5), 051010, (2007).
- S. E. Watkins, F. Akhavan, R. Dua, K. Chandrashekhara, and D. C. Wunsch, "Impact-Induced Damage Characterization of Composite Plates using Neural Networks," *Smart Mater. Struct.*, **16**(2), 515-524, (2007).
- B. Gray, R. H. Moss, D. Apel, and S. E. Watkins, "Optical Projection and Image Processing Approach for Mine Wall Monitoring," *Opt. Eng.*, **46**(1), 013601, (2007).
- S. E. Watkins, R. Luechtefeld, and V. Rajappa, "Communication and Teamwork Training Using an Engineering Simulation Game," *Innovations 2006: World Innovations in Engineering Education and Research*, edited by W. Aung, C. Crosthwaite, R. V. Espinosa, J. Moscinski, S. Ou, and L. M. S. Ruiz, (iNEER, Arlington, VA, 2006), Chapter 5, 39-50.
- R. J. Stanley, S. E. Watkins, R. H. Moss, and A. Gopal, "Traffic Monitoring Using a Three-Dimensional Object Tracking Approach," *Int. J. of Engineering Education*, **22**(4), 886-895, (2006).
- R. J. Stanley, S. E. Watkins, and R. H. Moss, "Integration of Real-World Problems into Image Processing Curriculum," *Int. J. of Engineering Education*, **21**(2), 318-326, (2005).
- R. Dua, S. E. Watkins, S. A. Mulder, and D. C. Wunsch, "MATLAB-based Introduction to Neural Networks for Sensors Curriculum," *Int. J. of Engineering Education*, **21**(4), 636-648, (2005).
- R. Dua, S. E. Watkins, and D. C. Wunsch, "Demodulation of Extrinsic Fabry-Perot Interferometric Sensors for Vibration Testing using Neural Networks," *Opt. Eng.*, **43**(12), 2976-2985, (2004).
- R. J. Stanley, S. E. Watkins, A. Gopal, and R. H. Moss, "A Web-Sharable Real-World Imaging Problem for Enhancing an Image Processing Curriculum," *IEEE Trans. Educ.*, **47**(2), 211-219, (2004).
- T. M. Swift and S. E. Watkins, "An Engineering Primer for Outreach to K-4 Education," *Journal of STEM Education: Innovations and Research*, **5**(3/4), 67-76, (2004). Available WWW: <http://www.jstem.org/>.
- S. E. Watkins, R. H. Hall, K. Chandrashekhara, and J. M. Baker, "Interdisciplinary Learning through a Connected Classroom," *Int. J. of Engineering Education*, **20**(2), 176-187 (2004).
- S. E. Watkins and R. H. Hall, "Complex Problem-Solving using Structured Collaboration," *Innovations 2003: World Innovations in Engineering Education and Research*, edited by W. Aung, M. H. W. Hoffman, N. W. Jern, R. W. King, and L. M. S. Ruiz, (iNEER, Arlington, VA, 2003), Chapter 29, 285-296.

- S. E. Watkins, "Smart Bridges using Fiber Optic Sensors," *IEEE Instrumentation and Measurement Magazine*, **6**(2), 25-30, (2003). (Invited Paper) (Reprinted with update for *IEEE-HKN The Bridge Magazine*, **110**(1), 30-38, (2014).)
- H. E. Nystrom, S. E. Watkins, A. Nanni, and S. Murray, "Financial Viability of Fiber Reinforced Polymer (FRP) Bridges," *J. of Management in Engineering*, **19**(1), 2-8, (2003).
- S. E. Watkins, V. M. Eller, and R. H. Hall, "WWW Instructional Documentation for the Development of a Smart Composite Bridge," *Int. J. of Continuing Engineering Education and Lifelong Learning*, **13**(1/2), 180-189, (2003).
- S. E. Watkins and R. Green, "Speaking and Writing Proficiency of International Graduate Students in Elective, Mentoring Environments," *J. of Engineering Education*, **92**(2), 147-154, (2003).
- V. E. Zetterlind III, S. E. Watkins, and M. Spoltman, "Fatigue Testing of a Composite Propeller Blade using Fiber-Optic Strain Sensors," *IEEE Sensors Journal*, **3**(4), 393-399, (2003).
- S. E. Watkins, G. W. Sanders, F. Akhavan, and K. Chandrashekhara, "Modal Analysis using Fiber Optic Sensors and Neural Networks for Prediction of Composite Beam Delamination," *Smart Mater. Struct.*, **11**(4), 489-495, (2002).
- A. Belarbi, S. E. Watkins, K. Chandrashekhara, J. Corra, and B. Konz, "Smart FRP Reinforcing Bars for Health Monitoring of Concrete Structures," *Smart Mater. Struct.*, **10**(3), 427-431, (2001).
- A. Lunia, K. M. Isaac, K. Chandrashekhara, and S. E. Watkins, "Aerodynamic Testing of a Smart Composite Wing using Fiber Optic Sensing and Neural Networks," *Smart Mater. Struct.*, **9**(6), 767-773, (2000).
- F. Akhavan, S. E. Watkins, and K. Chandrashekhara, "Prediction of Impact Contact Forces of Composite Plates using Fiber Optic Sensors and Neural Networks," *Mechanics of Composite Materials and Structures*, **7**(2), 195-205, (2000).
- F. Akhavan, S. E. Watkins, and K. Chandrashekhara, "Measurement and Analysis of Impact-Induced Strain using Extrinsic Fabry-Perot Fiber Optic Sensors," *Smart Mater. Struct.*, **7**(6), 745-751, (1998).
- A. L. Sears and S. E. Watkins, "A Multimedia Manual on the World Wide Web for Telecommunications Equipment," *IEEE Trans. Educ.* **39**(3), 342-348, (1996).
- S. E. Watkins, J. P. Black, and B. J. Pond, "Optical Scatter Characteristics of High-Reflectance Dielectric Coatings and Fused Silica Substrates," *Appl. Opt.* **32**(28), 5511-5518, (1993).
- C. K. Carniglia, J. P. Black, S. E. Watkins, and B. J. Pond, "Direct Observation of Wave-guided Scattered Light in Multilayer Dielectric Thin Films," *Appl. Opt.* **32**(28), 5504-5510, (1993).
- C. Zhang, S. E. Watkins, R. M. Walser, and M. F. Becker, "Laser-Induced Damage to Silicon Charge-Coupled Imaging Devices," *Opt. Eng.* **30**(5), 651-657, (1991).
- S. E. Watkins, C. Zhang, R. M. Walser, and M. F. Becker, "Electrical Performance of Laser-Damaged Silicon Photodiodes," *Appl. Opt.* **29**(6), 827-835, (1990).
- N. Imoto, S. E. Watkins, and Y. Sasaki, "A Nonlinear Optical-Fiber Interferometer for Nondemolitional Measurement of Photon Number," *Opt. Commun.* **61**(2), 159-163, (1987).

Selected Conference Papers and Reports

- C. M. Renne, S. E. Watkins, and J. G. Ciezki, "Comparison of Binary and Multi-level Logic Processing for an Optical Encoder," *Smart Structures and Materials/NDE 2018: Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems*, Proc. SPIE **10598**, 2018, 4-8 March 2018, Denver, CO.
- S. M. Damti, S. E. Watkins, and R. J. Stanley, "Comparison of Binary and Multi-level Logic Electronics for Embedded Systems," *Smart Structures and Materials/NDE 2016: Industrial and Commercial Applications of Smart Structures Technologies X*, Proc. SPIE **9801**, 2016, 20-24 March 2016, Las Vegas, NV.
- I. P. Dugganapally, S. E. Watkins, and B. Cooper, "Multi-level, Memory-based Logic using CMOS Technology," *2014 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, 583-588, 2014, 9-11 July 2014, Tampa, FL.
- K. Chandrashekhara, S. E. Watkins, A. Nanni, and P. Kumar, "Design and Technologies for a Smart Composite Bridge," *7th International IEEE Conference on Intelligent Transportation Systems (ITSC2004)*, 954-959, 2004, 3-6 October 2004, Washington, D.C.
- S. E. Watkins, J. F. Unser, A. Nanni, K. Chandrashekhara, and A. Belarbi, "Instrumentation and Manufacture of a Smart Composite Bridge for Short-Span Applications," *Smart Structures and Materials 2001: Smart Systems for Bridges, Structures, and Highways*, Proc. SPIE **4330**, 147-157, 2001, 4-8 March 2001, Newport Beach, CA.
- S. E. Watkins, R. Heimlich, and R. Reis, Jr., "Mapping of Absorption in Optical Coatings," *Laser Induced Damage in Optical Materials: 1991*, Proc. SPIE. **1624**, 246-255 (1992).
- T. Leary and S. E. Watkins, "Study on the Response of Multilayer Insulation to a 1.3 μm Gaussian Laser Beam," USAF Technical Report WL-TR-90-92 (1992).
- J. G. Ciezki and S. E. Watkins, "The Comprehensive Handling of Safety in an Autonomous Robot Capstone Project," *Proceedings of the 2017 ASEE Midwest Section Conference*, 24-26 September 2017, Stillwater, OK. (**Conference Best Paper**)
- S. E. Watkins, "Hypothetical Cases in Engineering Ethics," *Proceedings of the 2017 ASEE Gulf-Southwest Section Conference*, 12-14 March 2017, Dallas, TX.
- S. E. Watkins, "Teaching Engineering Ethics," *Proceedings of the 2015 ASEE Zone III Conference*, 23-25 September 2015, Springfield, MO.
- S. E. Watkins, T. M. Swift, and A. Kaur, "Work in Progress: Statistics Components in a Circuits Laboratory for ECE Sophomores," *Proceedings of the 2015 ASEE Annual Conference*, 14-17 June 2015, Seattle, WA.
- S. E. Watkins, D. R. Carroll, L. Kinsler, and J. Morse, "Organizing a Student Poster Session in an ASEE Section Conference," *Proceedings of the 2014 ASEE Annual Conference*, 15-18 June 2014, Indianapolis, IN.
- S. E. Watkins, "An Engineering Physics Introduction to Electronics for ECE Sophomores," *Proceedings of the 2013 ASEE Annual Conference*, 23-26 June 2013, Atlanta, GA.
- T. M. Swift, S. E. Watkins, K. Swenson, E. Lasater, and O. R. Mitchell, "Involving Engineering with In-Service K-4 Teachers," *Proceedings of the 2003 ASEE Annual Conference*, 22-25 June 2003, Nashville, TN.
- R. H. Hall, S. E. Watkins, and F. Ercal, "The Horse and the Cart in Web-Based Instruction: Prevalance and Efficacy," 81st Annual Meeting of the American Educational Research Association, New Orleans, Louisiana, 24-28 April 2000.

STUDENT SUPERVISION:

Doctoral Dissertations (Major Advisor – 6 Programs Complete)

Masters Theses (Major Advisor – 31 Programs Complete)

Undergraduate Projects (Major Advisor)

>45 Honors/OURE/Other Research Projects & >25 Undergraduate Senior Design Projects

ACADEMIC ACTIVITIES:

Selected Campus Service

Chair (2013-16), Missouri S&T Honorary Degrees Com.

Chair (2010-12) & Member (2009-11) Discipline Specific Curricula Com. (Engineering)

Chair (2005-16), EE Undergraduate Studies Com. & Member, ECE Executive Com.

Ethics Presentation to ECE Seniors in EE/CpE 4096, 1996-2019 except for sabbatical years

Curriculum Management, Development, and Accreditation

Coordinated Electrical Engineering B.S. ABET Visit Preparation – 2014 & 2008

Coordinated Electrical Engineering B.S. Curriculum Revisions – ECE Approval 2013 & 2006

Coordinated Electrical and Computer Engineering Accelerated MS/BS Development – 2016-18

Coordinated Electrical Engineering Course Renumbering – 2014

Coordinated Electrical Engineering Minor Development – 2013

Coordinated Electrical Engineering Emphasis Areas Revision & Degree Options – 2012 & 2011

Coordinated co-listing of EE/Phy 5200/4503, 5210/5503, and 5220/5513 – 1995

SELECTED ACTIVITIES:

Smart Composite Bridge

Principal Investigator and Project Coordinator – The first all-composite bridge in Missouri. This prototype pedestrian walkway was installed on the MoS&T campus in August 2000 and is rated for highway loads. It is a long-term technological demonstration of reinforced polymer (FRP) composites and a field laboratory for interdisciplinary courses. The bridge was designed, tested, manufactured, and installed as a cooperative effort among university, government, and industry partners. It is documented at smarteng.mst.edu/bridge.



Applied Optics Laboratory (APOL)

Laboratory Director – Current projects include UAV imaging, intelligent monitoring and imaging, video/image algorithms, and field data acquisition. Other significant projects include the characterization of sensor fatigue, neural-network-based processing of sensor signals, and the incorporation of fiber optic sensors in structures, and developments in engineering pedagogy.