



Formerly University of Missouri-Rolla

STEVE E. WATKINS

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Department of Electrical & Computer Engineering
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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 – July 2022	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 (Chief Advisor 2020-Present & Advisor 2014-20)
Faculty Advisor, MoS&T Aerospace and Electronic System Chapter of IEEE (2007-13)
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 2026, 2025, 2024, 2023, 2022, 2019, 2018, 2017, 2016, 2015, 2014, 2012, 2011, 2010, 2009, 2008, & 2007
Amateur Radio, Callsign WØWMO
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)
Member of Journals Task Force (2020-21)
Campus Representative for ASEE, MoS&T (2005-Present)

Institute of Electrical and Electronics Engineers (IEEE)

Member, IEEE Ethics and Member Conduct Committee (2021, 2020, & 2019)
Member, Hearing Board, IEEE Ethics and Member Conduct Committee (2025)
Voting Member, Educational Activities Board (2018)
Co-Chair, IEEE Teaching Excellence Hub (2021, 2022, 2023, & 2024) teaching.ieee.org
Board of Governors, IEEE Education Society, Vice-President of Educational Activities & Awards (2021-22 & 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)
Historian, IEEE-HKN, ECE Honor Society, (2022-Present)
Editor-in-Chief, IEEE-HKN, ECE Honor Society, *The Bridge Magazine* (2020-22 & 2013-17)
Committees, IEEE-HKN/HKN, Nominations & Appointments (2019-2025), Distinguished Service Award (2022-25), Election Tellers (2014 & 2013), Strategic Planning (2018-19 & 2014), & Faculty Advisor Committee (2003-09 and 2020-25)
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)
Committees, IEEE EAB, EPICS in IEEE Committee (2023-26), University Resources Committee Member (2023), & Faculty Resources Committee Chair (2020-22) & Member (2019-23)
Member, IEEE-USA Awards and Recognition Committee (2014-2015) and IEEE-USA Government Relations Council (2012)
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 and Student Competition Activities

Student Ethics Competition Chair, 2026, 2025, 2024, 2023, 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, 2025 Tau Beta Pi District 9 Conference
Host Faculty Advisor, 2007 Eta Kappa Nu Student Leadership Conference

Other Activities

Executive Council, Tau Beta Pi Association (2026-28), Secretary (2026)
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 (2010-12)
Member, SPIE Membership Committee (2011-13)
Missouri School Boards Association, Nominating Committee (2009-12)
Missouri School Boards Association, Strategic Communication & Technology Committee (2011-12)
Host Conference Chair, 2002 Region V Conference, Toastmasters International
Student Officer, UMR IEEE Student Branch: President (1982-83); Vice President (1981-82)
Student Officer, UMR Gamma Theta Chapter of Eta Kappa Nu, (1982-83)
Student Officer and Charter Member, UMR Student Toastmasters Club: President (1983)

Selected Speaking Events

Invited Speaker/Workshop (Selected)
IEEE/ASEE FIE Workshop “Special Session: Writing for the IEEE TEH” (2024)
ASEE Midwest Section, Lincoln, Nebraska, (2023)
Tau Beta Pi Convention, Denver, Colorado (2018)
Eta Kappa Nu Student Leadership Conference (2020, 2018, & 2004)
IEEE-Boeing NextTech Conference, St. Louis, Missouri (2015)
IEEE International Sections Congress (2008 & 2005)
IEEE-USA Leadership Conference (2005)

Selected Online and Student Events

Online Events

IEEE EA/EMCC Webinar “Engage Students with the IEEE Student Ethics Competition” (2025), IEEE EA/Education Society Webinar Presenter “Teaching Excellence Hub” (2024), IEEE/ASEE FIE Panel Moderator “Faculty Leadership” (2023), IEEE EA/Education Society Webinar Moderator “You Made Tenure, Now What?” (2023), IEEE EA/Education Society Webinar Moderator “Industry vs. Academia – Finding the Right Fit” (2022), IEEE EA/Education Society Webinar Moderator “Funding Opportunities with the National Science Foundation” (2022), IEEE EA/Education Society Webinar Moderator “Publishing Your Research-Advice from the Editors” (2022), IEEE EA/Education Society Webinar Panelist “Introducing the Teaching Excellence Hub” (2021), IEEE EA/Education Society Webinar Moderator “The Next Opportunity for Engineering Education” (2021), IEEE EA/Education Society Webinar Series (1-4) Moderator “Engineering Education 2.0” (2020-21), & IEEE EMCC Webinar Moderator “Ethics Lecture for Engineering Students” (2021).

IEEE-HKN

IEEE-HKN Video Panelist “15 Years of IEEE-Eta Kappa Nu” (2025), IEEE-HKN Student Leadership Conference Session Panelist “Career Advancement through Effective Communication” Sponsored by IEEE Education Society (2024), IEEE-HKN Student Leadership Conference Session Panelist “Pathways to Academia” Sponsored by IEEE Education Society (2022), IEEE-HKN Connection Podcast #4 Panelist “The HKN Awards Program” (2021), ECEDHA/IEEE-HKN Moderator “Town Hall Session #3” (2021), & IEEE-HKN Experience Moderator “Pathways to Academia” & Panelist “Partnering for Student Success” (2020),

AWARDS:

Fellow (2018) and Senior Member (2009) of SPIE; Senior Member (1998) of IEEE; Distinguished Member (2025) of ASEE
Honor Societies: Tau Beta Pi, IEEE-Eta Kappa Nu (IEEE-HKN), Sigma Xi, & Phi Kappa Phi
Tau Beta Pi-McDonald Mentor Award – 2024 Recipient
“For sustained contributions as an advisor and mentor for students and colleagues”
Distinguished Service Award from IEEE-HKN – 2021 Recipient
“For a career of outstanding contributions and sustained service to IEEE-HKN”
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”
Region 5 IEEE Awards: John Meredith Lifetime Achievement Award (2021), Outstanding Member (2005) & Outstanding Engineering Educator (1999)
St. Louis IEEE Section Awards: Member (2009 & 2005), Educator (1996), & Young Eng. (1994)
IEEE-USA Congressional Fellowship – 2004 Recipient
ASEE ECE Division Meritorious Service Award– 2023 Recipient
ASEE Midwest Section Outstanding Service Award– 2012 Recipient
ASEE Midwest Section Best Paper Award– 2017 First-Place Paper
ASEE Midwest Section Best Paper Award– 2012 Second-Place Paper
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 of the Year (2015), Outstanding Transfer Student Advisor (2007), Faculty Excellence (2000), & Outstanding Teacher (2002 & 1995)
Miner Alumni Awards: Outstanding Advising (1999) & Excellence in Teaching (1995)
Advisor of Distinction (IEEE-HKN) – 2025 Recipient
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
Rolla Community Award for Excellence in Engineering Design – 2000 Recipient Smart Composite Bridge Project Team (Watkins – Project Director)
APEX Awards of Excellence: IEEE-HKN *The Bridge* Magazine
2023 Grand Award Recipient Electronic Media Category (S. E. Watkins & S. Sedigh – Editors-in-Chief (EICs), & N. Ostin– Managing Editor (ME))
2022, 2021, 2018, 2017, 2016, 2015, & 2014 Various Categories (Watkins Co-EIC or EIC)
2020 Recipient Annual Report Category (Watkins –Author & Ostin & Bersani – MEs)
Toastmasters, Toastmaster of the Year in D8, 1992 & Area Governor of the Year in D23, 1991
Distinguished Toastmaster Program for Communication and Leadership, 1993
Recipient of NSF Graduate Fellowship (1984–1985 & 1986–1988), American Electronics Assoc.
Japan Research Fellowship (1985–1986), and UMR Chancellor’s Fellowship (1983–1984)
Recipient of UMR C. James Grimm Scholarship (1983), UMR Curators Scholarship (1979-83), UMR Development Scholarship (1979-83)

STUDENT SUPERVISION:

Doctoral Dissertations (Major Advisor – 6 Programs Complete)
Masters Theses (Major Advisor – 31 Programs Complete)
Undergraduate Projects (Major Advisor - >70 Projects Completed)

PUBLICATIONS AND PAPERS: ORCID 0009-0005-7052-3856

(Total Publications: 1 Patent, 5 Book Chapters, 48 Archival Papers, and >100 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 “Slide Rules,” *IEEE-HKN The Bridge Magazine*, Volume **121**(1), 2025 (hkn.ieee.org).

Guest Editor for Special Issue on “LIDAR,” *IEEE-HKN The Bridge Magazine*, Volume **119**(1), 2023 (hkn.ieee.org).

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).

Magazine and General Papers/Publications

S. E. Watkins, “IEEE Student Ethics Competition and Cases,” *IEEE Teaching Excellence Hub*, Posted Sept. 16, 2024. Available: <https://teaching.ieee.org/>.

S. E. Watkins and Nancy M. Ostin, “The HKN Honor Society as an Institutional Resource,” *IEEE Teaching Excellence Hub*, Posted Aug. 24, 2023. Available: <https://teaching.ieee.org/>.

J. J. Sluss, R. Meier, and S. E. Watkins, “2021 IEEE Education Society Awards,” *IEEE Trans. Educ.* **65**(1), 101-104, (2022) doi: 10.1109/TE.2021.3136370.

S. E. Watkins, “HKN Outstanding Young Professional Award and Roger I. Wilkinson,” *IEEE-HKN The Bridge Magazine*, **118**(1), 26-27, (2022).

*K. R. Owens and S. E. Watkins, “Quality-of-Service Architecture for Cloud Computing Networking,” *IEEE-HKN The Bridge Magazine*, **117**(3), 10-15, (2021).

S. E. Watkins, “*The Bridge Magazine* of Eta Kappa Nu, Part 1 and Part 2,” *IEEE-HKN The Bridge Magazine*, Part 1, **116**(3), 34-35, (2020) and Part 2, **117**(2), 39-41, (2021).

S. E. Watkins, “HKN Eminent Members,” *IEEE-HKN The Bridge Magazine*, **116**(2), 18-19, (2020).

S. E. Watkins, “2018 Annual Report for IEEE-Eta Kappa Nu,” *IEEE-HKN The Bridge Magazine*, **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). doi: 10.1109/MPOT.2013.2255518.

*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). doi: 10.1109/MAES.2013.6516147.

S. E. Watkins, “IEEE-HKN: The Electrical and Computer Engineering Honor Society,” *IEEE Potentials*, **31**(4), 19-21, (2012). doi: 10.1109/MPOT.2012.2195224.

J. K. Stroble (Nagel), S. E. Watkins, and R. B. Stone, “Biology-Inspired Sensor Design,” *IEEE Potentials*, **28**(6), 19-24, (2009). doi: 10.1109/MPOT.2009.934892.

- *J. K. Stroble (Nagel), R. B. Stone, and S. E. Watkins, "An Overview of Biomimetic Sensor Technology," *Sensor Review*, **29**(2), 112-119, (2009). doi: 10.1108/02602280910936219.
- *S. E. Watkins, "Smart Bridges with Fiber Optic Sensors," *IEEE Instrumentation and Measurement Magazine*, **6**(2), 25-30, (2003). (Invited Paper) doi: 10.1109/MIM.2003.1200280. (Reprinted with update for *IEEE-HKN The Bridge Magazine*, **110**(1), 30-38, (2014).)
- 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).
* These papers are included in "Archival Papers" count; all other general papers are in "Other Papers" count.

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.
- 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. 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.**)
- 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.
- 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

- A. Kaur, S. Anandan, L. Yuan, S. E. Watkins, Y. Zhang, K. Chandrashekhara, and H. Xiao, "Embeddable Optical Fiber Sensor for Simultaneous Strain and Temperature Monitoring," *Opt. Eng.*, **65**(1), 016101, (2026). doi: 10.1117/1.OE.65.1.016101.
- 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). doi: 10.1117/1.OE.58.7.072004.
- 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). doi: 10.1117/1.OE.55.3.037102.

- 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). doi: 10.1117/1.OE.53.1.017105.
- 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).
- K. N. Rodhouse, B. Cooper, and S. E. Watkins, "Programming for Pre-college Education using Squeak Smalltalk," *ASEE 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). doi: 10.1177/1045389X10386987.
- 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). doi: 10.1080/15501320903091043.
- 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). doi: 10.1117/1.3259359.
- 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). doi: 10.1080/17480930802618661.
- 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). doi: 10.1088/0964-1726/17/4/045015.
- 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). doi: 10.1061/(ASCE)1090-0241(2007)133:9(1167).
- 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) doi: 10.1088/0964-1726/16/5/N01.
- A. M. Abdi and S. E. Watkins, "Strain Sensor Calibration using Extrinsic Fabry-Perot Interferometric Sensors," *Opt. Eng.*, **46**(10), 104402, (2007). doi: 10.1117/1.2793713.
- A. M. Abdi and S. E. Watkins, "Demodulation of Fiber-Optic Sensors for Frequency Response Measurement," *IEEE Sensors Journal*, **7**(5), 667-676, (2007). doi: 10.1109/JSEN.2007.893238.
- 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). doi: 10.1088/0964-1726/16/2/033.

- 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). doi: 10.1117/1.2740758.
- 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). doi: 10.1117/1.2424914.
- 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. 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. 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, and D. C. Wunsch, "Demodulation of Extrinsic Fabry-Perot Interferometric Sensors for Vibration Testing using Neural Networks," *Opt. Eng.*, **43**(12), 2976-2985, (2004). doi: 10.1117/1.1814365.
- R. J. Stanley, S. E. Watkins, A. Gopal, and R. H. Moss, "A Web-Shareable Real-World Imaging Problem for Enhancing an Image Processing Curriculum," *IEEE Trans. Educ.*, **47**(2), 211-219, (2004). doi: 10.1109/TE.2004.825214.
- 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/>. ERIC Number: EJ1063383.
- 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).
- 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). doi: 10.1061/(ASCE)0742-597X(2003)19:1(2).
- 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). doi: 10.1504/IJCEELL.2003.002160.
- 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). doi: 10.1002/j.2168-9830.2003.tb00753.x.
- 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). doi: 10.1109/JSEN.2003.815795.
- 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). doi: 10.1088/0964-1726/11/4/302.
- 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). doi: 10.1088/0964-1726/10/3/301.
- 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). doi: 10.1088/0964-1726/9/6/305.

- 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). doi: 10.1080/107594100305375.
- 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). doi: 10.1088/0964-1726/7/6/002.
- 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). doi: 10.1109/13.538757.
- 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). doi: 10.1364/AO.32.005511.
- 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). doi: 10.1364/AO.32.005504.
- 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). doi: 10.1117/1.2221305.
- 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). doi: 10.1364/AO.29.000827.
- 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). doi: 10.1016/0030-4018(87)90240-9.

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. doi: .
- 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. doi: .
- 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. doi: .
- 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. doi: .
- 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. doi: .
- 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). doi: .

- 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).
- T. Swift, S. E. Watkins, and A. Kaur, "WIP – A Canvas Public Course for Electrical Engineering," *ASEE/IEEE Frontiers in Education Conference*, 2-5 November 2025, Nashville, TN. doi: .
- S. Gillespie, S. E. Watkins, and A. F. Moran, "Understanding Student Perceptions of Project Impact in the EPICS in IEEE Service-Learning Program," *ASEE/IEEE Frontiers in Education Conference*, 13-16 October 2024, Washington, DC. doi: .
- 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**) doi: .
- S. E. Watkins, "Hypothetical Cases in Engineering Ethics," *Proceedings of the 2017 ASEE Gulf-Southwest Section Conference*, 12-14 March 2017, Dallas, TX. doi: .
- S. E. Watkins, "Teaching Engineering Ethics," *Proceedings of the 2015 ASEE Zone III Conference*, 23-25 September 2015, Springfield, MO. doi: .
- 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. doi: .
- 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. doi: .
- 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. doi: .
- 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. doi: .
- E. C. Eckhoff, V. M. Eller, S. E. Watkins, and R. H. Hall, "Interactive Virtual Laboratory for Experience with a Smart Bridge Test," *Proceedings of the 2002 ASEE Annual Conference*, 16-19 June 2002, Montreal, Quebec. doi: .
- R. H. Hall, S. E. Watkins, and F. Ercal, "The Horse and the Cart in Web-Based Instruction: Prevalence and Efficacy," 81st Annual Meeting of the American Educational Research Association, New Orleans, Louisiana, 24-28 April 2000. doi: .

ACADEMIC ACTIVITIES:

Selected Campus Service

Member (2025-26), Missouri S&T Miner Wall of Fame Review Com.
Chair (2013-16) & Member (2013-16 & 2024-26), 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, 1996-2026 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