

# Edward J. Coyle

## Contact Information:

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<http://coyle.gatech.edu> <http://vip.gatech.edu>



## Professional Experience:

- Jan. 2013 – Present Visiting Professor at the University of Strathclyde, Glasgow Scotland
- Jan. 2008 – Present John B. Peatman Distinguished Professor and Georgia Research Alliance Eminent Scholar, Georgia Tech
- Jan. 2008 – Present Director, Arbutus Center for the Integration of Research and Education, Georgia Tech
- Sept. 2006 – June 2007 Kenan Trust Visiting Professor for Distinguished Teaching, Princeton University
- Aug. 2003 – Dec. 2007 Co-Director of the Center for Wireless Systems and Applications in the College of Engineering, Purdue University
- Aug. 2002 – Dec. 2007 Co-Founder and Director of the EPICS Entrepreneurship Initiative within the Burton Morgan Center in Purdue's Discovery Park
- May 2001– Dec. 2007 Founder and Director, Center for Technology Roadmapping, Purdue University
- April 2000 – July 2004 Assistant Vice Provost for Research in Computing and Communications, Purdue University; 1/4-time appointment
- Sept. 1999 – Sept. 2002 Co-Founder and Co-Director, National Engineering Projects in Community Service (EPICS) Program.
- Jan. 1999 – Dec. 2000 Director, Motorola-Purdue Alliance
- Aug. 1995 – Sept. 2002 Co-Founder and Co-Director, Center for Engineering Projects in Community Service (EPICS) at Purdue University
- Aug. 1994 – Dec. 2007 Professor, School of Electrical and Computer Engineering, Purdue University
- Aug. 1990 – Aug. 1991 Visiting Professor, Department of Electrical Engineering, University of Delaware
- Aug. 1986 – Aug. 1994 Associate Professor, School of Electrical Engineering, Purdue University
- Aug. 1982 – Aug. 1986 Assistant Professor, School of Electrical Engineering, Purdue University

**Education:**

PhD 1982 Princeton University, Electrical Engineering and Computer Science  
MSE 1980 Princeton University, Electrical Engineering and Computer Science  
BEE 1977 University of Delaware, Electrical Engineering

**Honors and Awards:***From the National Academy of Engineering:*

2005 Bernard M Gordon Prize for Innovation in Engineering and Technology Education; with L.H. Jamieson and W.C. Oakes. Citation: "For innovations in the education of tomorrow's engineering leaders by developing and disseminating the Engineering Projects in Community Service (EPICS)." The Gordon Prize consists of a gold medallion and a \$500,000 cash award that has been used to create an endowment for the EPICS Program. Note that EPICS evolved into the VIP Program: <http://vip.gatech.edu>

*From the Institute of Electrical and Electronics Engineers:*

IEEE Fellow: For contributions to the theory of nonlinear signal processing, 1998  
ASSP Society's 1986 Best Paper Award for Authors under age 30 for "Median Filtering by Threshold Decomposition," by J. P. Fitch, E. J. Coyle and N.C. Gallagher, vol. ASSP-32, pp. 1183-1188, Dec. 1984.

Myril B. Reed Best Paper Award from the 32nd Midwest Symposium on Circuits and Systems for "Minimum Mean Absolute Error Stack Filtering with Syntactic Constraints," by M.Gabbouj and E.J. Coyle, Urbana, IL, Aug. 1989.

Delaware Bay Section Scholastic Achievement Award, 1978.

*From the American Society for Engineering Education:*

1997 Chester F. Carlson Award for Innovation in Engineering Education, with L.H. Jamieson.

*From the State of Indiana:*

First Annual Governor's Award for Outstanding Volunteerism, presented to the EPICS Program, January 2003.

*Awards from Industry:*

Finalist, 2000 Boeing Outstanding Educator Award Competition, with L.H. Jamieson and W.C. Oakes.

Recognition of Excellence for the EPICS Program from Microsoft Research, with L.H. Jamieson and W.C. Oakes, 2002.

Scott Paper Company Leadership Award, 1975-77.

*From Conferences:*

Best Paper Award for "Optimal Distributed Estimation in Mobile Ad Hoc Sensor Networks," by X. Sun and E.J. Coyle, from the Int'l Conf. on Advanced Intelligence And Awareness Internet (IC-AIAI 2011), Shenzhen China, Oct 28-30, 2011.

*From the ECE Department Heads Association (ECEDHA):*

Innovative Program Award for the creation of the EPICS Program, with L.H. Jamieson. March 13, 2006.

*From the University of Strathclyde, Glasgow, Scotland:*

Named a Visiting Professor for 2012-present in honor of his assistance with the launch of the VIP Program at the University of Strathclyde in Glasgow, Scotland.

*From Purdue University:*

Schools of Engineering Faculty Award for Engagement/Service; Citation: "For

his outstanding work in fostering multidisciplinary learning and creating partnerships to support research, policy, and planning.” March 2005.  
Schools of Engineering Team Excellence Award, with L.H. Jamieson, W.C. Oakes, and P. Brown; Citation: “For the creation, institutionalization, and dissemination of the EPICS Program.” March 2003.  
2002 Focus Award, presented to the EPICS Program for outstanding contributions to the furthering of Purdue’s commitment to disability accessibility & diversity.  
Class of 1922 Award for Outstanding Innovation in Helping Students Learn, University-wide Award, with L.H. Jamieson, 1997.  
Ruth and Joel Spira Outstanding Teacher Award, School of Electrical and Computer Engineering, with L.H. Jamieson, 1997.

From Princeton University:

Wallace Memorial Fellowship in Engineering, 1980, 1981.

From the University of Delaware:

Outstanding Service Award, Dept. of Electrical and Computer Engineering, 2016.  
Distinguished Engineering Alumnus of the University of Delaware, 1998.  
College of Engineering Freshman Scholarship, 1974.  
John B. Lynch Scholarship, 1974, 1975.

From National Ilan University

Lifetime Honorary Consultant for the National Ilan Univ. VIP Program, 2012 – present.

From the Community of Greater Lafayette, IN:

Together Everyone Achieves More (TEAM) Award presented in July 1998 to the EPICS Program by the Wabash Center in recognition of the contributions of EPICS teams to furthering the mission of the Center.

**Selected Current (2011-16) Activities**

Created the Vertically-Integrated Projects (VIP) Program at Georgia Tech. Disseminated the VIP Program to 20 other universities under a \$5M grant from the Helmsley Charitable Trust. See <http://vip.gatech.edu>. Focusing on system reform of higher education as VIP spreads throughout all disciplines and to many other universities.

Developing a research effort in the area of are of the Internet-o-Things (IoT) that includes both theoretical research and the creation of an extensive testbed for wireless sensor networks in Bobby-Dodd stadium via the eStadium VIP project.

Serving as a member of the Committee to Strengthen Undergraduate Research Experiences that has been organized by the National Academies.

**Research Grants and Contracts Received:**

1. Principal Investigator: NSF, ECS 82-06407, NEFRI, “Analysis and Improvement of the Performance of Random Access Protocols,” 2-1-83 to 1-31-84, \$10,000.
2. David Ross Grant, “Stability and Performance of Carrier Sense Multiple Access Networks,” 9-1-84 to 8-31-86, \$13,200.
3. Principal Investigator: NSF, ECS 83-07140, “Research Initiation: Homogeneous, Nonhomogeneous, and Interconnected Carrier Sense Multiple Access Networks,” 6-1-83 to 11-30-85, \$48,000.
4. Co-Principal Investigator (with N.C. Gallagher): NSF, ECS 83-06235, “Analysis, Design and Applications of Median-Type Filters,” 9-1-83 to 8-31-86, \$178,000.

5. Participant: IBM, Federal Systems Division, Manassas, Virginia; Principal Investigator: Howard J. Siegel, "Distributed System Interconnection Study," Contract Number 289662B-YD, 7-7-83 to 12-31-83, \$25,000.
6. Co-Principal Investigator (with N. C. Gallagher and S. C. Bass): NSF, ECS 84-13195, "A VLSI Implementation of a Fast Median Filtering Algorithm," 5-1-85 to 4-30-86, \$29,842.
7. Principal Investigator: AT&T Information Systems, "Modeling, Analysis and Control of Computer Communication Networks," 700-1285-0036, 2-1-85 to 1-30-89, \$131,700.
8. Co-Principal Investigator (with J. S. Lehnert): Engineering Research Center in Intelligent Manufacturing Systems, "Communications in the Factory of the Future," 501-1285-0038, 501-1285-0111, 6-1-86 to 5-31-89, Coyle's support: \$243,409.
9. Co-Principal Investigator (with N. C. Gallagher and G. S. Wasserman): NSF, EET 87-21333, "Stack Filters, Threshold Architectures, and Information Encoding in Neural Systems," 8-15-88 to 8-14-90, \$220,000.
10. L. H. Jamieson and S. C. Bass, "Engineering Research Equipment Grant: Digital Signal Processing," Faculty Associates: G. D. Allen, E. J. Coyle, O. K. Ersoy, C. D. McGillem, NSF, CDA 88-07978, 8-1-88 to 1-31-92, \$154,456.
11. Co-Principal Investigator (with M.-T. Hsiao), AT&T Bell Labs, "Modeling and Analysis of Local Area Networks," 1/1/90-12/31/90, \$14,000.
12. Co-Principal Investigator (with A. Ghafoor, H.J. Siegel, M.-T. Hsiao, and J.K. Antonio), NSF, CDA 91-21771, "CISE Research Instrumentation: High Speed Optical Network Testbed for Research in Telecommunication and Massive Parallel Computation," 5-1-92 to 9-30-93, \$150,667.
13. Participant, (PI: E.J. Delp; Other participant: M.S. Lundstrom), "The Purdue/AT&T Multimedia Testbed," 10/94 - 9/97, \$375,000.
14. Co-Principal Investigator (with L.H. Jamieson and H.G. Dietz), U.S. Department of Education, Fund for the Improvement of Postsecondary Education (FIPSE), "Engineering Assistance for Community Service Organizations," Grant no. P116F50129-01, August 1995 to July 1997, \$70,658.
15. E.J. Coyle, L.H. Jamieson and H.G. Dietz, Donation to the Purdue EPICS Program from Comdisco, Inc., Feb. 1995, \$100,000.
16. Principal Investigator (co-PIs: N.B. Shroff, E.K.P. Chong, E.J. Delp, and A.A. Maciejewski), NSF, CDA 94-22250, "CISE Research Instrumentation: VIADuct: A Testbed to Study Video, Image, Audio, and Data Traffic on a High-Speed Network," 5-1-95 to 4-30-96, \$226,217.
17. Co-Principal Investigator (PI: J.P. Allebach; other co-PIs: C.A. Bouman, E.J. Delp, D.A. Landgrebe, A.A. Maciejewski, Z. Pizlo, N.B. Shroff), Hewlett-Packard Company, "Infrastructure for a New Curriculum in Video and Image Systems Engineering," Hewlett-Packard Company Equipment Gift, HP Gift No. 30009, 1-25-96, \$364,845.70.
18. Principal Investigator, (co-PIs: H.G. Dietz, J.L. Gray, L.H. Jamieson, K.T. Kornegay, C.-M. Ong), NSF, DUE 96-50771, "A Hardware Prototyping Facility in Support of the EPICS Program at Purdue University," 5-1-96 to 4-31-98, \$79,310.
19. Co-Principal Investigator, (PI: J.P. Allebach; Other Co-PIs: C. A. Bouman, E. J. Coyle, E.J. Delp, A.A. Maciejewski, N.B. Shroff, and Z. Pizlo), Hewlett-Packard Company Voluntary Support, Gift No. 30009.1 "Infrastructure for a New Curriculum in Video and Image Systems Engineering," 3-1-96, \$29,170.00 equipment.
20. Co-Principal Investigator, (PI: J.P. Allebach; Other Co-PIs: C. A. Bouman, E. J. Coyle, E. J. Delp, A.A. Maciejewski, N.B. Shroff, and Z. Pizlo), Hewlett-Packard Company

- Voluntary Support, Gift No. 30009.2 “Infrastructure for a New Curriculum in Video and Image Systems Engineering,” 8-22-96, \$6,000.
21. Co-Principal Investigator, (PI: J.P. Allebach; Other Co-PIs: C. A. Bouman, E. J. Coyle, E.J. Delp, A.A. Maciejewski, N.B. Shroff, and Z. Pizlo: Hewlett-Packard Company Voluntary Support, Gift No. 32322 “Infrastructure for a New Curriculum in Video and Image Systems Engineering,” 9-6-96, \$479,609 equipment.
  22. Co-Principal Investigator, (PI: J.P. Allebach; Other Co-PIs: C. A. Bouman, E. J. Coyle, E.J. Delp, A.A. Maciejewski, N.B. Shroff, and Z. Pizlo), Hewlett-Packard Company Voluntary Support, Gift No. 30009.3 “Infrastructure for a New Curriculum in Video and Image Systems Engineering,” 12-17-96, \$201,000 equipment.
  23. Co-principal Investigator, (PI: J.D. Jones; Other Co-PIs: L.H. Jamieson, P. Davies, “Modern Manufacturing Capability for the Engineering Projects in Community Service (EPICS) Program,” NSF DUE 98-51200, 9-1-98 to 7-31-99, \$55,000.
  24. As Co-Director (with L.H. Jamieson) of the EPICS Program: Donation of \$2000 per semester to the EPICS Program from Advanced Micro Devices (AMD) for the “AMD EPICS Design Award,” This award is made each semester to the EPICS team or group of EPICS students who produce and implement the most innovative designs; Commitment to this sequence of design awards made 12-18-96.
  25. Principal Investigator (co-PIs: J.P. Allebach, C.A. Bouman, E.J. Delp, M.P. Harper, L.H. Jamieson, N.B. Shroff), “CISE Research Instrumentation: Storage and I/O Devices for the Support of Research in Imaging Systems, Networks, and Video and Speech Processing,” NSF, CDA 96-17388, 1-1-97 to 12-31-98, \$236,627.
  26. Co-Principal Investigator (PI: L.H. Jamieson; Other co-PIs: J.D. Jones (ME), P.A. Davies (ME), D.D. Knudsen (Sociology), and V. Goldschmidt (FrEngr)), “EPICS: Engineering Projects in Community Service,” The Corporation for National Service, Grant no. 97LHEIN025, 8-15-97 to 8-14-98, \$278,000.
  27. Co-Principal Investigator (Other Co-PIs: J.P. Allebach, M.R. Bell, C.A. Bouman, E.K.P. Chong, E.J. Delp, P.C. Doerschuk, S.B. Gelfand, J.V. Krogmeier, M.P. Harper, L.H. Jamieson, N.B. Shroff, M.D. Zoltowski), “Intel equipment for Processing and Communication Intensive Tasks that Enable New Networked Video, Image, and Speech Applications,” Intel Corporation, 7-1-97 to 6-30-00, \$598,000. This is a sub-grant of an equipment grant of \$6,200,000 provided by Intel to Purdue University; PIs: W.K. Fuchs and A. Sameh.
  28. Co-Principal Investigator (Other Co-PIs: C. Brodley, R. Eigenmann, J.A.B. Fortes, K.T. Kornegay, M.S. Lundstrom, M.R. Melloch, and K. Roy), “Second-Generation Purdue University Network Computer Hub for Research and Education on Microelectronics, Computer Architecture and VLSI Design,” Intel Corporation, 7-1-97 to 6-30-00, \$300,598. This is a sub-grant of an equipment grant of \$6,200,000 provided by Intel to Purdue University; PIs: W.K. Fuchs and A. Sameh.
  29. Donations for the EPICS Program, 1997: \$25,187 FPGA Hardware and Software for EPICS teams; and, \$50,000 in software and training materials from Microsoft.
  30. Principal Investigator, “Pricing and Accounting for Internet Telephony,” Bellcore -- through the Software Engineering Research Center, 8-17-98 to 8-16-99, \$35,391.
  31. Principal Investigator, “Motorola-Purdue Alliance,” MTS Systems Corporation, 01/04/99 to 01/03/00, 673-1285-2836, \$157,862.
  32. Principal Investigator, “Motorola-Purdue Alliance,” MTS Systems Corporation, 01/04/99 to 01/03/00, 673-1285-2836, \$118,317.

33. Microsoft Research: Donation of software, training materials, and computers to the EPICS Program, valued at \$1,100,000, August 1999.
34. Co-Principal Investigator (Other Co-PIs: L.H. Jamieson and W.C. Oakes), Microsoft Community Affairs, "Expansion of the National EPICS Program," \$50,000 plus software valued at \$250,000, 11/99 to 10/00.
35. Principal Investigator, (Co-PIs: Leah H. Jamieson and William C. Oakes), "Creation and Evaluation of the National EPICS Program," NSF, EEC-9903195, 09/15/99 to 08/31/02, \$752,226. Other universities participating as subcontractors: Georgia Tech, Notre Dame, University of Wisconsin-Madison.
36. Co-Principal Investigator, (PI: William C. Oakes; Other Co-PI; Leah H. Jamieson), "The EPICS Consortium: A National-Scale Service Learning Program in Engineering," Corporation for National Service: Learn and Serve Higher Education, 8/00-7/01, \$350,000, Grant no. 00LHEIN025, renewable yearly through 7/03, for a total funding level of \$1,050,000. Other universities participating as subcontractors: Georgia Tech, Iowa State, Notre Dame, University of Wisconsin-Madison, Case Western, Penn State.
37. Grants and donations from corporations and foundations to Local Corporate Partners program of the Purdue EPICS Program during the 2000-01 academic year: Eli Lilly and Co, \$15,000; Motorola Foundation, \$9000; AMD, \$9000; ADC Foundation, \$9000; General Motors, \$6000.
38. Grants and donations from corporations and foundations to the Local Corporate Partners Program of the Purdue EPICS Program during the 2000-01 academic year: ADC Foundation, \$6000.
39. Principal Investigator, (Co-PIs: Leah H. Jamieson and William C. Oakes), "EPICS: Creating a Nationwide Multidisciplinary Service Learning Program," Purdue Universities Academic Reinvestment Program, Recurring funds of \$100,000/yr, beginning August 2001.
40. Purdue International Travel Grant, "Consult with the Centre for Technology Management at Cambridge University," Cambridge, UK, October 13-17, 2001, \$978.
41. Principal Investigator, "Science and Technology Roadmaps and Predicting the Future of Cellular Telephony," Motorola, Inc., May 5, 2001, \$12,000.
42. Principal Investigator, "Software and Technical Support for Creation of the Center for Science and Technology Roadmaps," The Learning Trust, March 2002, \$1,200,000.
43. Principal Investigator, (Co-PIs: Leah H. Jamieson and William C. Oakes), "Catalyzing the Commercialization of Inventions from the EPICS Program," part of the Discovery Park grant from the Lilly Endowment, Aug. 1, 2001 to July 30, 2004, \$600,000.
44. Co-Principal Investigator, (Other Co-PI: Dennis Engi ), "Science and Technology Policy and Planning (STePP)," support from Purdue's e-Enterprise Center to create course modules, industry workshops, and a new course in IE in the area of science and technology policy and planning, Jan. 2003-Dec.2003, \$35,000.
45. Co-Principal Investigator, (PI: W.C. Oakes; Other Co-PIs: L.H. Jamieson, S. Maller), "National Dissemination of the National EPICS Program," NSF DUE-0231361, 2/15/03-1/31/07, ECE share- \$402,668; Total \$2,549,960.
46. Principal Investigator, (Co-PIs, Mark R. Bell, Oleg Wasynczuk), "Network-based Techniques for Detecting and Controlling Synchronization of Power Systems," AFRL via PCKA, Inc., 1/1/04-12/31/04, \$50,000.
47. Co-Principal Investigator (PI: Alok Chaturvedi, Other co-PIs: Melissa Dark, Dennis Engi, Shailendra Mehta), "Center for Computational Homeland Security," Indiana 21<sup>st</sup>

- Century Research and Technology Fund, Proposal ID: 1110030618. Partners: Purdue University (Lead), IU School of Medicine, Indiana Counter-Terrorism and Security Council, Eli Lilly, NSWC-Crane, Indiana Health Industries Forum, Indiana University, SWI Disaster Resistant Community, City of West Lafayette, Ports of Indiana, Proteum; Total Project Cost: \$7,818,721, Fund Request: \$2,199,070.
48. Co-Principal Investigator (PI: Oleg Wasynczuk, Other Co-PIs: Doug Adams, Venkataramanan Balakrishnan, Mark Bell, Thomas Downar, Timothy Fisher, Christoph Hoffmann, Cheng-Kok Koh, Paul Krause, Chee-Mun Ong, Voicu Popescu, Shripad Revankar, Mario Rotea, John Sullivan, Lefteri Tsoukalas), “Center for Security of Large-Scale Systems, PCKA, Inc., Jan 04 - Dec. 04, \$1,027,984.
  49. Grant from Hollister, Inc. in support of the EPICS Entrepreneurship Initiative, Sept. 2004 -August 2009, \$100,000.
  50. Co-Principal Investigator, (PI: Jan Allebach; Other Co-PIs: D. Blakesley, J. Campbell, D. Felluga, L. Jamieson, J. Krueger, and C. Sigurdson, "Integration of Digital Publishing in Teaching and Learning," Hewlett-Packard Company, Purdue Account No. 671-1285-4804, 7-18-05, voluntary support of \$40,000 plus over \$50,000 equipment.
  51. Co-Principal Investigator, (Other Co-PIs: Ness Shroff and Jim Krogmeier), “Creation of the Wireless Vertically-Integrated Projects (VIP) Program: Integrating and Enhancing Undergraduate Education and Graduate Research in the Center for Wireless Systems and Applications,” Motorola Foundation, Jan 2005 – Dec. 2007, \$500,000.
  52. Co-Principal Investigator, (PI: T. Downar; Other Co-PIs: O. Wasynczuk, C. Hoffmann, A. Meliopoulos, L. Tsoukalis), “DDDAS-TMRP: DDDAS for Autonomic Interconnected Systems: The National Energy Infrastructure,” CNS-0540342, Sept. 1, 2005 – Aug 31, 2006, \$200,000.
  53. Principal Investigator, “Distributed Incumbent Detection and Optimal Response Formulation for Wireless Networks,” Raytheon, Inc., Jan 2007 – Dec 2007, \$38,000.
  54. Co-Principal Investigator, (PI: Catherine Peters; Other Co-PI: Michael Littman), “Engineering Projects in Community Service,” Center for Innovation in Engineering Education, Princeton University; Redistribution Proposal within Princeton University encourage students to enroll in, or to work on joint projects with students enrolled in the School of Engineering and Applied Science, Sept. 2007 – August 2010, \$49,000 (renewable for up to three years).
  55. Co-Principal Investigator, (Other Co-PIs: James V. Krogmeier and Aaron C. Ault), “Gold and Black Partnership Agreement; Rich Immersive Sports Experience,” Motorola Labs, Dec. 1, 2007 – November 30, 2008, \$75,000.
  56. Co-Principal Investigator, (Other Co-PIs, Randal Abler and the eStadium VIP team), “The eStadium SensorNet Project: The College Football Stadium of the Future,” Texas Instruments, Fall 2009, \$7500.
  57. Principal Investigator, (Co-PIs at Georgia Tech: Randal Abler and Julia Melkers; PI and Co-PIs at Purdue: James V. Krogmeier (PI), Saurabh Bagchi and Jan P. Allebach), "Collaborative Research: The VIP Program - Integrating Undergraduate Design Projects and Graduate Research," DUE-0837225, June 1, 2009 – May 31, 2011, \$67,268 for GaTech; \$82,731.53 for Purdue.
  58. Co-Principal Investigator, (Other Co-PIs, Randal Abler and the eStadium VIP team), “The eStadium Sensor Network,” National Instruments, Nov. 2010, \$26,626.

59. Principal Investigator, (Co-PIs: Julia Melkers and Randal Abler), “Creating & Studying a Global Web of Vertically-Integrated Projects (VIP) Programs,” Global GT-FIRE Program, July 1, 2012 – June 30, 2013, \$30,000.
60. Principal Investigator, (Co-PI: Randal Abler), Gift to Support Research from BIT Systems, Inc, Aug 15, 2012, \$16,000.
61. Establishment of the Warren Batts Endowment for the VIP Program, Summer 2012, \$250,000.
62. Establishment of the Hugh Austin Brown Endowment for the VIP Program, Spring 2012, \$250,000.
63. Co-Principal Investigator, (PI: Randal Abler), “High-Performance Architectures and Algorithms for Software Radios,” BIT Systems, Inc., January 1, 2013 – December 31, 2014, \$312,426.
64. Principal Investigator, (Co-PIs: 12 Co-PIs from VIP Consortium: GT, Purdue, Univ. of Michigan, Univ. of Washington, UC-Davis, Colorado State, Howard Univ., Indiana Univ., Florida International Univ., Virginia Commonwealth Univ., Boise State Univ., Univ. of Strathclyde), “Planning Grant Proposal to the The Leona M. and Harry B. Helmsley Trust for The Creation and Evaluation of the VIP Consortium,” From the Helmsley Trust, Feb 1, 2014 – July 31, 2014, \$69,305.
65. Principal Investigator, (CoPIs: R.T. Abler, and J. Sonnenberg-Klein), "VIP Innovation Showcase and Competition," Cisco Systems, Inc., gift made July 2014 for the 2014-15 AY, \$10,000.
66. Principal Investigator, “The Vertically Integrated Projects (VIP) Consortium: Achieving Systemic Reform of Higher Education in STEM Fields,” The Leona M. and Harry B. Helmsley Charitable Trust, Jan 1, 2015 to Dec. 31, 2017, \$5,000,000. Consortium Leaders and VIP Site Directors:
  - Consortium Director and GT Site Director: Edward J. Coyle, Georgia Tech
  - Consortium Co-Director – Technology, Site Co-Director: Randal T. Abler, Georgia Tech
  - Co-Director for Minority Serving Institutions, Site Director: Amos Johnson, Morehouse College
  - Co-Director for Diversity, Site Director: Eve Riskin, University of Washington
  - Site Director: Brian E. Gilchrist, University of Michigan
  - Site Director: Harold Blackmun, Boise State University
  - Site Director: Jan P. Allebach, Purdue University
  - Site Director: Prasad Enjeti, Texas A&M University
  - Site Directors: Behnaam Aazhang, Rice University
  - Site Director: Charles Kim, Howard University
  - Site Director: Masoud Sadjadi, Florida International University
  - Site Director: Edwin Chong, Colorado State University
  - Site Director: Aaron Ohta, University of Hawaii-Manoa
  - Site Director: Franklin Bost, Virginia Commonwealth University
  - International Site Director: Steven Marshall, Univ. of Strathclyde, Glasgow, Scotland
  - International Site Director: Josh, National Ilan University, Ilan, Taiwan
67. Co-Principal Investigator (Other Co-PI: Randal Abler), “VIP Partnership Program Membership,” Harris Corporation, 1/1/2016-12/31/2018, \$90,000.



### **Grants Facilitated while an Assistant VP for Research at Purdue (4/2000-7/2004):**

1. Lead Project Organizer at Purdue. (PI at Purdue: Chris Clifton; CO-PIs at Purdue: Walid Aref, Ahmed Elmagarmid, Arif Ghafoor, and Sunil Prabhakar), “Washington Project: A Knowledge Projection System for the Maintenance of Navy Ships,” Partners: Purdue, NSWC/Crane, EG&G, and IU; funded through the Navy’s SmartShip Program, Oct. 1, 2001 to Sept. 30, 2002, \$2.4M; Oct 1, 2003 to Sept. 2004, \$1.5M; year 3 pending. Purdue’s share: 1/3.
2. Lead Project Organizer at Purdue. (PI at Purdue: Oleg Wasynczuk), “Washington Project: The Center for Security of Large Scale Systems,” Partners: Purdue, PCKA, AFRL-WPAFB, NSWC-Crane. Funded through a Phase III SBIR between PCKA and AFRL. Jan 1, 2004 to Dec. 31 2004, \$3M; Year 2 \$3M. Purdue’s share in first year: ~\$1.1M.

### **Professional Society Activities:**

#### *Member:*

IEEE Communications Society, 1980-present  
IEEE Signal Processing Society, 1982-present  
Association for Computing Machinery, 1985-present  
American Society for Engineering Education, 1997-present  
Technical Committee on Digital Signal Processing  
of the IEEE Circuits and Systems Society, 1989-1999  
Board of Governors of IEEE Circuits and Systems Society, 1992-1995  
Advisory Committee of IEEE Winter Workshop on Nonlinear Digital Signal  
Processing, Tampere, Finland, Jan. 17-20, 1993  
Organizing Committee, ITCOM 2001, SPIE International Symposium

#### *Associate Editor:*

IEEE Transactions on Circuits and Systems, 6/89-6/91

#### *Program Committee Member:*

1991 International Symposium on Circuits and Systems  
1992 International Symposium on Circuits and Systems  
1994 International Symposium on Circuits and Systems  
Infocom 1993  
1995 IEEE Workshop on Nonlinear Signal Processing  
1994 Midwest Symposium on Circuits and Systems  
1997 International Symposium on Circuits and Systems  
Eurasip 2000 - European Signal Processing Conference  
2003 International Conference on Image Processing  
2007 Workshop on Nonlinear Signal and Image Processing

#### *Chair:*

Technical Committee on Digital Signal Processing of the IEEE Circuits and  
Systems Society, 1991-1993  
1997 IEEE/EURASIP Workshop on Nonlinear Signal and Image Processing,  
Grand Hotel, Mackinac Island, Michigan, Sept. 7-11, 1997.  
Workshop on the Creation of the VIP Consortium, Georgia Tech, Atlanta GA,  
April 10-11, 2014, funded by the Helmsley Trust and attended by faculty

from 17 universities.

**Ph.D. Thesis Supervision Completed:**

1. J. Patrick Fitch, "Analysis and Implementation of Median-Type Filters," July 1984. Supervised jointly with N. C. Gallagher. (Purdue)  
J.P. Fitch and E.J. Coyle were co-recipients of the 1986 Best Paper Award for Authors under Age 30 from the IEEE Signal Processing Society
2. Peter D. Wendt, "Rank-Order Type Operators in Adaptive Quantization and Digital Signal Processing," August 1985. Supervised jointly with N. C. Gallagher. (Purdue)
3. Steven L. Beuerman, "Quasi-Birth-Death Processes and Their Use in the Modeling and Analysis of Computer Networks," August 1986. (Purdue)
4. R. Lee Hamilton, "Modeling and Analysis of Multi-hop and Priority Random Access Computer Networks," Sept. 1986. (Purdue)  
In 2004 Lee Hamilton was named an Outstanding Electrical and Computer Engineering Alumnus of Purdue University.
5. Jean-Hsang Lin, "Optimal Nonlinear Filtering under the Mean Absolute Error Criterion," May 1989. (Purdue)
6. Ji Zhang, "The Performance Analysis of Computer Communication Networks," August 1989. (Purdue)  
In 2004 Ji Zhang was named an Outstanding Electrical and Computer Engineering Alumnus of Purdue University.
7. Moncef Gabbouj, "Estimation and Structural Based Approach for the Design of Optimal Stack Filters," December 1989. (Purdue)  
M Gabbouj and E.J. Coyle were co-recipients of the Myril B. Reed Best Paper Award from the 32'nd Midwest Symposium on Circuits and Systems in 1989
8. G. Rama Murthy, "Transient and Equilibrium Analysis of Computer Networks: Finite Memory and Matrix Geometric Recursions," December 1989. (Purdue)
9. Pao-Ta (Paul) Yu, "Design of Stack Filters with Specified Invariant Signals and Associative Memory Behavior," December 1989. (Purdue)
10. Liangchien Lin, "Theory of and Parallel Algorithms for Stack Filters," December 1990. Supervised jointly with George B. Adams. (Purdue)
11. Sherry X. Wei, "Architecture and Buffer Management Policies in Fast Packet Switching" May 1992. (Purdue)
12. Jisang Yoo, "Stack Filters: Design Algorithms and Applications," May 1993. (Purdue)
13. Kwun-Nan (Kevin) Lin, "Surface and 3D Triangular Meshes from Planar Cross Sections," May 1997. (Purdue)
14. Qiwei Xiao, "Modeling of Long-term Dependent VBR Video Sources and Implementation of Web-Based Network Management," August 1997. (Purdue)
15. Ilya Shmulevich, "Properties and Applications of Monotone Boolean Functions and Stack Filters," August 1997. (Purdue)
16. Jianping Xu, "Performance Analysis of Interfaces between Networks and a Recursive Solution to Two-Dimensional QBD Processes," December 1998. (Purdue)
17. Jr-Jen Huang, "The Use of Human Visual System Models in the Design of Optimal Stack Filters," May 1999. (Purdue)
18. Po-Hao Chang, "Performance Analysis of a Hybrid WDMA/CDMA All-Optical Network," May 2000. (Purdue)

Po-Hao won a Best Paper Award from the IASTED Int'l Conference on Wireless and Optical Communication, Banff Canada, 2002 for a paper about WDMA/CDMA all-optical networks that was based on his thesis work.

19. Seema Bandyopadhyay, "Energy Efficiency and Spatiotemporal Sampling in Wireless Sensor Networks," May 2004. (Purdue)
20. Qingjiang Tian, "Distributed Data Collection, Detection, and Estimation in Sensor Networks," August 2006. (Purdue)
21. Xuan Zhong, "Data Acquisition and Dissemination in Wireless Networks: Theory and Experiments," December 2007. (Purdue)
22. Pablo Navarrete Michelini, "Extended Convergence Analysis for Multi-grid Algorithms and its Application in Mobility Models," August 2008. (Purdue)
23. Murat Senel, "Improving the Performance of Links and Synchronization in Wireless Networks," December 2008. (Purdue)
24. Vibhav A. Kapnadak, "Distributed Estimation and Detection in Wireless Sensor Networks," May 2010. (Purdue)
25. Xusheng Sun, "Optimal Distributed Detection and Estimation in Static and Mobile Wireless Sensor Networks," August 2012. (Georgia Tech)
26. Seksan Laitrakun, "Distributed Detection and Estimation with Reliability-Based Splitting Algorithms in Random-Access Networks," December 2014. (Georgia Tech)

#### **M.S. Thesis Supervision Completed:**

1. M. Gabbouj, "Optimal Stack Filter Examples and Positive Boolean Functions," Dec. 1986.
2. A. Hydrie, "Interactive Video Delivery over Asynchronous Transfer Mode (ATM) Networks," May 1996.
3. H. Abdur-Rahman, "Netscope: Network Status Monitoring and Prediction using WEBM," May 2000.
4. A.C. Ault, "Evaluation of Received Signal Strength for Localization in Sensor Networks," December 2005.

**M.S. Students Currently Being Supervised:** None at this time.

#### **Ph.D. Students Currently Being Supervised, all at Georgia Tech:**

1. Deepa Phanish, "Synchronization and Routing in Wireless Sensor Networks," Expected completion: December 2016.
2. Paul Garver, "Theory and Implementation of Distributed Cognitive Radio Systems," Expected completion: August 2017.

#### **Courses Developed at Purdue University (1982-2007):**

1. EE-647: "Computer Communication Networks," Spring 1983
2. EE-643: "Stochastic Processes in Information Systems," Spring 1985
3. EE-640X: "Nonlinear Digital Signal Processing," Fall 1985
4. EE-290, 390, 490: "Sophomore, Junior, and Senior Participation in EPICS: Engineering Projects in Community Service," Fall 1995, with Leah Jamieson.
5. ECE-495T,U,V: "Sophomore, Junior, Senior, and Graduate Student Participation in Vertically Integrated Projects in Electrical and Computer Engineering," Fall 2002, with J.P. Allebach and J.V. Krogmeier.

**Courses Developed at Princeton University (2006-07):**

1. EGR-250, 350, 450: “Sophomore, Junior, and Senior Participation in EPICS: Engineering Projects in Community Service,” Fall 2006.

**Courses Developed at Georgia Tech:**

1. ECE-2811, 3811, 3812, 4811, 4812: “Sophomore, Junior, Senior, and Graduate Student Participation in Vertically-Integrated Projects” Created Fall 2008. Students from more than 22 different disciplines have participated in VIP so far. In Fall 2016 approximately 520 undergraduates were participating in VIP, most via these courses but some in special projects courses in Biology, Physics, CEE, etc.

**Laboratory Facilities Developed for Courses:**

1. Purdue: The *EPICS Software (1995)* and *EPICS Hardware Prototyping Facilities (1997)*, in support of the EPICS Program at Purdue, with P. Davies, H.G. Dietz, J.L. Gray, L.H. Jamieson, J.D. Jones, K.T. Kornegay, C.-M. Ong.
2. Purdue: The *EPICS Entrepreneurship Initiative’s Laboratory Facilities (2005)* supporting commercial development of products developed by EPICS teams under the EPICS Entrepreneurship Initiative.
3. Purdue: Laboratory facilities for the *Vertically Integrated Projects Program (2005)*.
4. Georgia Tech: Laboratory facilities for the *Vertically Integrated Projects Program (2009)*. These facilities, which were developed in collaboration with Dr. Randal Abler, include an embedded systems lab, a VLAN, and a server cloud that are all available for every VIP team.

**Short-Courses and Industry Workshops Organized:**

1. “*Strategic and Technology Roadmapping*,” Developed and taught to 40 industry-based attendees for the Japan Advanced Institute for Science and Technology (JAIST), 1/9/2004-1/24-2004, Tokyo Japan. Also counts as the course module for industry workshops on technology roadmapping proposed for the e-Enterprise Center grant “Science and Technology Policy and Planning (STePP).”

**External Committee Activities:**

1. Dean’s Advisory Council, *Colorado State University*, 2000-2004.
2. Chester F. Carlson Award Committee, *American Society for Engineering Education*, 2005, three-year term.
3. Member of the International Advisory Committee for the Dept of Electrical and Computer Engineering, *Beijing Jiaotong University*, 2008-present.
4. Member of the Academic Program Committee organized by the Provost's Office for the Dept of Electrical and Computer Engineering at the *University of Delaware*, 2009.
5. Member of the Advisory Committee for the Dept of Electrical and Computer Engineering at the *University of Delaware*, 2010-present.
6. Member of the Technical Committee for the Improvement of STEM Education, *American Association of Universities*, Spring 2013 – present.

7. Member of the Committee on Strengthening Research Experiences for Undergraduate STEM Students, *The National Academies*, 2015 – present.
8. Member of the Committee on Improving Undergraduate STEM Education through Broader Impacts, *American Association of Universities*, Spring 2015 – present.

**University-wide/College-wide Committee Activities:**

1. Georgia Tech, Jan. 2008-present.
  - a. Institute Reappointment, Promotion and Tenure Committee, 2015 – present.
  - b. Institute Undergraduate Curriculum Committee, 3-year term, starting Aug. 2014.
  - c. Council for Educational Technology, 2012-2014.
  - d. College of Engineering Reappointment, Promotions and Tenure Committee, 2012.
2. Purdue University, August 1982 – December 2007.
  - a. Faculty Affiliate of the Burton D. Morgan Center, 2004-2008.
  - b. Member of the Entrepreneurship Certificate Task Force: responsible for creation of a Purdue-wide program in entrepreneurship learning Certificate, 2004-2006.
  - c. University Senate, 2001–2003.
  - d. Member of Ad-Hoc Strategic Planning Committee for Purdue University, 2001-2002.
  - e. Visual Arts Committee, 1996–1998.
  - f. Superior Students Committee, 1985–1988.
3. Princeton University, August 1978 – August 1982.
  - a. Priorities Committee (Univ. Budget Priorities Committee) 1980, 1981.

**Research Book Contributions and Books Published:**

1. PhD Thesis: “Markov Chain Models of Asynchronous Random Multiple Access Networks,” Thesis Advisor: Prof. Bede Liu, Fellow of the IEEE and Member of the NAE, August 1982.
2. E.J. Coyle, “The Theory and VLSI Implementation of Stack Filters,” Chapter appearing in *VLSI Signal Processing, II*, IEEE Press, edited by S. Y. Kung, R. E. Owen, and J. G. Nash, pp. 141-151, 1986. (text for Conference Presentation [21])
3. J. Zhang and E.J. Coyle, “Transient Analysis of the M(t)/M(t)/1 Queue,” Chapter 36 in “*Numerical Solutions of Markov Chains*,” pp. 655-658, edited by W.J. Stewart, Marcel Dekker, Inc., New York, 1990. (reprint of Conference Paper [44]).
4. E.J. Coyle, J.-H. Lin, and M. Gabbouj, “Optimal Stack Filtering and the Estimation and Structural Approaches to Image Processing,” Chapter appearing in *Digital Image Processing*, edited by Rama Chellappa, pp. 230-259, IEEE Computer Society Press, 1992. (reprint of Serial Journal Article [13])
5. E. Coyle, “Stack Filters in Signal and Image Processing,” Chapter in *Circuits and Systems Tutorials*, edited by Chris Toumazou, Nick Battersby, Sonia Porta, Wiley-IEEE Press, Dec. 1995.
6. E.J. Coyle and G.B. Adams III, Co-editors of the Proceedings of the 1997 *IEEE/EURASIP Workshop on Nonlinear Signal and Image Processing*, Mackinac Island, MI, Sept. 7-10, 1997, available on-line at <http://www.ecn.purdue.edu/NSIP/>.
7. E.J. Coyle and L.H. Jamieson, “EPICS: Service Learning by Design,” appeared in *Projects that Matter: Concepts and Models for Service-Learning in Engineering*, E. Tsang, editor, American Association for Higher Education (AAHE), 2000, pp. 59-74
8. L.H. Jamieson, W.C. Oakes, and E.J. Coyle, “EPICS: Serving the Community through Engineering Design Projects,” chapter in *Learning to Serve: Promoting Civil Society Through Service Learning*, Norwell, MA: Kluwer Academic Publishers, 2001.

9. P.M. Buzzanell, E.J. Coyle, L.H. Jamieson, and W.C. Oakes, "Engineering Difference," appeared in "Case Studies for Organizational Communication: Understanding Communication Processes," edited by J. Keyton and P. Shockley-Zalabak; Los Angeles, CA, Roxbury, 2004, pp157-167.
10. R.T. Abler, E.J. Coyle, A. Kiopa, and J. Melkers, "Team-based Software/System Development in a Vertically-Integrated, Project-Based Course," Chapter in *Advanced Information Technology in Education*, edited by Khine Soe Thaug, Springer, New York, 2012, pp. 286-294.
11. E.J. Coyle, J.V. Krogmeier, R.T. Abler, A. Johnson, S. Marshall and B.E. Gilchrist, "The Vertically-Integrated Projects (VIP) Program: Leveraging Faculty Research Interests to Transform Undergraduate STEM Education," Chapter in *Transforming Institutions: Undergraduate STEM Education for the 21<sup>st</sup> Century*, edited by G.C. Weaver, W.D. Burgess, A.L. Childress, and L. Slakey; Purdue University Press, West Lafayette, IN 2016; pp. 223-234.

### **Serial Journal Regular Articles:**

1. E. J. Coyle and B. Liu, "A Matrix Representation of CSMA/CD Networks," *IEEE Transactions on Communications*, vol. COM-33, no. 1, pp. 53-64, Jan. 1985.
2. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "Root Properties and Convergence Rates of Median Filters," *IEEE Trans. on Acoustics Speech and Signal Processing*," vol. ASSP-33, no. 1, pp. 230-240, Feb. 1985.
3. J.P. Allebach, D.W. Sweeney, J.P. Fitch, N.C. Gallagher, and E.J. Coyle, Abstract: "Optical Implementation of Median Filters," *Journal of the Optical Society of America A*, Vol. 2, No. 1, p. 73, 1985.
4. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "Median Filtering by Threshold Decomposition," *IEEE Trans. on Acoustics Speech and Signal Processing*, vol. ASSP-32, no. 6, pp. 1183-1188, Dec. 1984. Best Paper Award for Authors under Age 30, ASSP Society, 1986.
5. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "Threshold Decomposition of Multi Dimensional Ranked Order Operations," *IEEE Trans. on Circuits and Systems*, vol. CAS-32, no. 5, pp. 445-451, May 1985.
6. P. D. Wendt, E. J. Coyle, and N. C. Gallagher, "Some Convergence Properties of Median Filters," *IEEE Trans. on Circuits and Systems*, vol. CAS-33, no. 3, pp. 276-286, March 1986.
7. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "The Analog Median Filter," *IEEE Trans. on Circuits and Systems*, vol. CAS-33, no. 3, pp. 94-103, Jan. 1986.
8. P. D. Wendt, E. J. Coyle, and N. C. Gallagher, "Stack Filters," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. ASSP-34, no. 4, pp. 898-911, August 1986.
9. E. J. Coyle, "Rank-Order Operators and the Mean Absolute Error Criterion," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. ASSP-36, no. 1, pp. 63-76, Jan. 1988.
10. S. L. Beuerman and E. J. Coyle, "The Delay Characteristics of CSMA/CD Networks," *IEEE Transactions on Communications*, vol. COM-36, no. 5, pp. 553-563, May 1988.
11. E. J. Coyle and J.-H. Lin, "Stack Filters and the Mean Absolute Error Criterion," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. ASSP-36, no. 8, pp. 1244-1254, August 1988.

12. S. L. Beuerman and E. J. Coyle, "State Space Expansions and the Limiting Behavior of Quasi-Birth-Death Processes," *Advances in Applied Probability*, vol. 21, no. 2, pp. 284-314, June 1989.
13. J. Zhang and E. J. Coyle, "Transient Analysis of Quasi-Birth-and-Death Processes," *Communications in Statistics: Stochastic Models*, vol. 5, no. 3, pp. 459-496, July-August 1989.
14. E. J. Coyle, J.-H. Lin, and M. Gabbouj, "Optimal Stack Filtering and the Estimation and Structural Approaches to Image Processing," *IEEE Trans. on Acoustics, Speech and Signal Processing*, vol. ASSP-37, no. 12, pp. 2037-2066, December 1989.
15. J.-H. Lin, T. M. Sellke and E. J. Coyle, "Adaptive Stack Filtering under the Mean Absolute Error Criterion," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, vol. ASSP-38, no. 6, pp. 938-954, June 1990.
16. J.-H. Lin and E. J. Coyle, "Minimum Mean Absolute Error Estimation over the Class of Generalized Stack Filters," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. ASSP-38, no. 4, pp. 663-678, April 1990.
17. M. Gabbouj and E. J. Coyle, "Minimum Mean Absolute Error Stack Filtering with Structural Constraints and Goals," *IEEE Trans. on Acoustics, Speech and Signal Processing*, vol. ASSP-38, no. 6, pp. 955-968, June 1990.
18. P.-T. Yu and E. J. Coyle, "Convergence Behavior and N-Roots of Stack Filters," *IEEE Trans. on Acoustics, Speech and Signal Processing*, vol. ASSP-38, no. 9, pp. 1529-1544, September 1990.
19. M. Gabbouj and E.J. Coyle, "On the LP which Finds a MMAE Stack Filter," *IEEE Trans. on Acoustics, Speech and Signal Processing*, vol. ASSP-39, no. 11, pp. 2419-2424, November 1991.
20. M. Gabbouj, E.J. Coyle, and N.C. Gallagher, "An Overview of Median and Stack Filtering," *Circuits, Systems, and Signal Processing*, vol. 11, no. 1, pp. 7-45, January 1992.
21. M. Gabbouj, P.-T. Yu, and E.J. Coyle, "Convergence Behavior and Root Signal Sets of Stack Filters," *Circuits, Systems, and Signal Processing*, vol. 11, no. 1, pp. 171-193, January 1992.
22. J. Zhang and E.J. Coyle, "The Transient Solution of Time-Dependent M/M/1 Queues," *IEEE Trans. on Information Theory*, vol. IT-37, no. 6, pp. 1690-1695, November 1991.
23. G. R. Murthy, M. Kim, and E. J. Coyle, "Equilibrium Analysis of Skip-Free Markov Chains: Nonlinear Matrix Equations," *Communications in Statistics: Stochastic Models*, vol. 7, no. 4, pp. 547-572, 1991.
24. P.-T. Yu and E. J. Coyle, "The Classification and Associative Memory Capability of Stack Filters," *IEEE Trans. on Signal Processing*, vol. 40, pp. 2483-2497, Oct. 1992.
25. P.-T. Yu and E.J. Coyle, "On the Existence and Design of the Best Stack Filter Based Associative Memory," *IEEE Trans. on Circuits and Systems II: Analog and Digital Signal Processing*, vol. 39, no. 3, pp. 171-184, March 1992.
26. J. Yoo, C.A. Bouman, E.J. Delp, and E.J. Coyle, "The Nonlinear Prefiltering and Difference of Estimates Approach to Edge Detection: Applications of Stack Filters," *CVGIP: Graphical Models and Image Processing*, vol. 55, no. 2, pp. 140-159, March 1993.
27. L.C. Lin, G.B. Adams III, and E.J. Coyle, "Stack Filter Lattices," *Signal Processing*, vol. 38, no. 3, pp. 277-297, August 1994.

28. G.B. Adams III, E.J. Coyle, L.C. Lin, L. Lucke, and K.K. Parhi, "Input Compression and Efficient VLSI Architectures for Rank Order and Stack Filters," *Signal Processing*, vol. 38, no. 3, pp. 441-453, August 1994.
29. C. Bajaj, E.J. Coyle, and K.-N. Lin, "Arbitrary Topology Shape Reconstruction from Planar Cross Sections," *CVGIP: Graphical Models and Image Processing*, vol. 58, no. 6, Nov. 1996.
30. J. Yoo, E.J. Coyle, and C.A. Bouman, "Dual Stack Filters and the Modified Difference of Estimates Approach to Edge Detection," *IEEE Trans. on Image Processing*, vol. 6, no. 12, Dec. 1997.
31. E.J. Coyle, L.H. Jamieson, and L.S. Sommers, "EPICS: A Model for Integrating Service-Learning into the Engineering Curriculum," *Michigan Journal of Community Service Learning*, Vol. 4, pp. 81-89, Fall 1997.
32. E.J. Coyle and L.H. Jamieson, "EPICS: Service-Learning by Design," chapter in the monograph, *Projects that Matter: Concepts for Service-Learning in Engineering*, American Association for Higher Education, ISBN 1-56377-019-9, Fall 1998.
33. C.L. Bajaj, E.J. Coyle, and K.-N. Lin, "Tetrahedral Meshes from Planar Cross-Sections," *Computer Methods in Applied Mechanics and Engineering*, Vol. 179, Issue 1, pp. 31-52, 1999.
34. J. Yoo, K.L. Fong, J.-J. Huang, E.J. Coyle, and G.B. Adams, "Fast Algorithms for Designing Stack Filters," *IEEE Transactions on Image Processing*, Vol. 8, No. 10, pp. 1014-1028, August 1999.
35. I. Shmulevich, O. Yli Harja, E.J. Coyle, D. Povel, K. Lemstrom, "Perceptual Issues in Music Pattern Recognition -- Complexity of Rhythm and Key Finding," *Computers and the Humanities*, Vol. 35, No. 4, Kluwer Academic Publishers, pp. 23-35, 2001.
36. S. Bandyopadhyay and E.J. Coyle, "Minimizing Communication Costs in Hierarchically-clustered Networks of Wireless Sensors," *Computer Networks*, Vol. 44, Issue 1, pp. 1-16, January 2004.
37. E.J. Coyle, L.H. Jamieson, and W.C. Oakes, "EPICS: Engineering Projects in Community Service," *International Journal of Engineering Education*, Vol. 21, No. 1, pp. 139-150, January 2005.
38. S. Bandyopadhyay, Q. Tian, E.J. Coyle, "Spatio-Temporal Sampling Rates and Energy Efficiency in Wireless Sensor Networks," *IEEE/ACM Transactions on Networking*, Vol. 13, No. 6, pp. 1339-1352, December 2005.
39. E.J. Coyle, L.H. Jamieson, and W.C. Oakes, "Integrating Engineering Education and Community Service: Themes for the Future of Engineering Education," *Journal of Engineering Education*, Vol. 95, No. 1, pp. 7-12, January 2006 (invited paper).
40. Q.-J. Tian, S. Bandyopadhyay, and E.J. Coyle, "Designing Directional Antennas to Maximize Spatio-temporal Sampling Rates in Multi-hop Clustered Sensor Networks," *Journal of Internet Technology*, Vol. 8 No. 1, Jan. 2007. (invited paper)
41. Q.-J. Tian and E.J. Coyle, "A MAC-Layer Retransmission Algorithm Designed for the Physical Layer Characteristics of Clustered Sensor Networks," *IEEE Transactions on Wireless Communications*, Vol. 5, No. 11, pp. 3153-64, Nov. 2006.
42. S. Bandyopadhyay, E.J. Coyle, and T. Falck "Stochastic Properties of Mobility Models in Mobile Ad-Hoc Networks," *IEEE Transactions on Mobile Computing*, Vol. 6, No. 11, pp. 1218-1229, Nov. 2007.
43. Q. Tian and E.J. Coyle, "Optimal Distributed Detection in Clustered Wireless Sensor Networks," *IEEE Transactions on Signal Processing*, Vol. 55, No. 7, pp. 1-13, July 2007.



44. P. Navarrete and E.J. Coyle, "A Semi-algebraic Approach that Enables the Design of Inter-grid Operators to Optimize Multi-grid Convergence," *Numerical Linear Algebra with Applications*, Vol. 15, pp. 219-247, March 2008.
45. X. Sun and E.J. Coyle, "Low-Complexity Algorithms for Event Detection in Wireless Sensor Networks," *IEEE Journal on Selected Areas in Communications*, Vol. 28, No. 7, pp. 1138 -1148, Sept. 2010.
46. V. Kapnadak, M. Senel and E.J. Coyle, "Low-Complexity, Distributed Characterization of Interferers in Wireless Networks," *Int'l Journal of Distributed Sensor Networks*, Article ID 980953, Oct. 2011, at <http://www.hindawi.com/journals/ijdsn/2011/980953/>
47. V. Kapnadak, M. Senel and E.J. Coyle, "Distributed Iterative Quantization for Interference Characterization in Wireless Networks," *Digital Signal Processing*, Vol. 22, No. 1, pp. 96-105, Jan. 2012.
48. P. Top, M.R. Bell, E.J. Coyle, O. Wasynczuk, "Observing the Power Grid: Working Toward a More Intelligent, Efficient, and Reliable Smart Grid with Increasing User Visibility," *IEEE Signal Processing Magazine*, Vol. 29, No. 5, pp. 24-32, Sept. 2012.
49. X. Sun and E.J. Coyle, "The Effects of Motion on Distributed Detection in Mobile Ad Hoc Sensor Networks," *Int'l Journal of Distributed Sensor Networks*, March 2012, Article ID 460924, <http://www.hindawi.com/journals/ijdsn/2012/460924/>
50. X. Sun and E.J. Coyle, "Quantization, Channel Compensation, and Optimal Energy Allocation for Estimation in Sensor Networks," *ACM Transactions on Sensor Networks*, Vol. 8, No. 2, pp. 15:1-15:25, March 2012.
51. V. Kapnadak and E.J. Coyle, "Optimal Non-Uniform Deployment of Sensors for Distributed Detection in Wireless Sensor Networks," *ACM Transactions on Sensor Networks*, Vol. 10, #1, pp. 89-97, January 2014.
52. S. Laitrakun and E.J. Coyle, "Reliability-Based Splitting Algorithms for Time-Constrained Distributed Detection in WSNs," *IEEE Transactions on Signal Processing*, Vol. 62, #21, pp. 5536-5552, November 2014.
53. D. Phanish and E.J. Coyle, "Application-based optimization of multi-level hierarchical clusters in ad hoc and sensor networks," submitted to the *IEEE Transactions On Wireless Communications*, July 2016.

#### **Conference Proceedings and Presentations:**

1. E. J. Coyle and P. Warter, "A System for Electronic Type," *Proceedings of the 1979 IEEE Delaware Bay Microcomputer Conference*, Newark, DE, pp. 79-84, March 1979.
2. E. J. Coyle and B. Liu, "Calculation of the Stability Characteristics and Buffer Requirements of CSMA/CD Networks," *Proceedings of the 1982 International Conference on Communications*, Philadelphia, PA, pp. 7F.1.1-7F.1.5, June 1982.
3. E. J. Coyle and B. Liu, "A Matrix Representation of CSMA/CD Networks - the Simplest Case," *Proceedings of the 1983 International Conference on Communications*, Boston, MA, pp. C.5.1.1-C.5.1.4, June 1983.
4. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "Root Properties and Convergence Rates of Median Filters," *Proceedings of the Twenty-First Allerton Conference on Communication, Control, and Computing*, pp. 1024-1033, Monticello, IL, Oct., 1983.
5. E. J. Coyle and A. A. Lazar, "Optimal Flow Control in a CSMA/CD Environment," *Proceedings of the Twenty-First Allerton Conference on Communication, Control, and Computing*, pp. 170-179, Monticello, IL, Oct. 1983.

6. E. C. Bronson, E. J. Coyle, and L. J. Siegel, "Modeling of English Speech for the Design of a Distributed Speech Understanding System," *Proceedings of the 1984 Conference on Acoustics, Speech, and Signal Processing*, pp. 42.6.1-42.6.4, San Diego, CA, March 1984.
7. P. D. Wendt, E. J. Coyle, and N. C. Gallagher, "A Limit on the Number of Passes to a Root for Median Filters," *Proceedings of the 1984 Princeton Conference on Info. Science and Systems*, pp. 378-381, Princeton, NJ, March 1984.
8. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "Median Filtering by Threshold Decomposition," *Proceedings of the 1984 Princeton Conference on Information Science and Systems*, pp. 382-386, Princeton, NJ, March 1984.
9. J. P. Fitch, E. J. Coyle, and N. C. Gallagher, "The Analog Median Filter," *Proceedings of the Twenty-Second Allerton Conference on Communication, Control, and Computing*, pp. 182-191, Monticello, IL, Oct. 1984.
10. S. L. Beuerman and E. J. Coyle, "The Distribution of Delay and Caudal Characteristic Curve of CSMA/CD Networks," *Proceedings of the Twenty-Second Allerton Conference on Communication, Control, and Computing*, pp. 395-404, Monticello, IL, Oct. 1984.
11. P. D. Wendt, E. J. Coyle, and N. C. Gallagher, "Stack Filters: Their Definition and Some Initial Properties," *Proceedings of the 1985 Hopkins Conference on Information Science and Systems*, pp. 378-383, Baltimore, MD, March 1985.
12. S. L. Beuerman, E. J. Coyle, "The Tail of the Waiting Time Distribution of a CSMA/CD Network," *Proceedings of the 1985 IEEE Global Communications Conference*, New Orleans, LA, Dec. 1985.
13. R. L. Hamilton, E. J. Coyle, "Analysis of a Priority CSMA/CD Network," *Proceedings of the 1985 IEEE Global Communications Conference*, pp. 5.5.1-5.5.6, New Orleans, LA, Dec. 1985.
14. N. C. Gallagher, E. J. Coyle, and S. Naqvi, "An Application of Median Filters to Digital Television," *Proceedings of the 1986 Int. Conf. on Acoustics Speech, and Signal Processing*, pp. 2451-2454, Tokyo, Japan, April 1986.
15. E. J. Coyle, "On the Optimality of Rank-Order Operations," *Proceedings of the 1986 Int. Conf. on Acoustics, Speech, and Signal Processing*, pp. 2539-2542, Tokyo, Japan, April 1986.
16. J. P. Allebach, D. W. Sweeney, J. P. Fitch, N. C. Gallagher, and E. J. Coyle, "Optical Implementation of Median Filters," presented at the *1985 Annual Meeting of the Optical Society of America*, Washington, DC, October 14-18, 1985.
17. R. L. Hamilton and E. J. Coyle, "A Two-Hop Packet Radio Network with Product-Form Solution," *Proc. of the 1986 Conf. on Information Science and Systems*, pp. 871-876, Princeton, NJ, March 19-21.
18. S. L. Beuerman and E. J. Coyle, "Closed Form Recursive for the Stationary Probability Vector of a Quasi-Birth-Death Process with a Guard State," *Proc. of the 1986 Conf. on Information Science and Systems*, pp. 460-464, Princeton, NJ, March 19-21, 1986.
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  134. X. Sun and E.J. Coyle, "The Effects of Motion on Applications in Mobile Ad-Hoc Sensor Networks," *IEEE Vehicular Technology Conference (VTC 2010)*, Taipei, Taiwan, May 16-19, 2010.
  135. R. Abler, J.V. Krogmeier, A. Ault, J. Melkers, T. Clegg, and E.J. Coyle, "Enabling and Evaluating Collaboration of Distributed Teams with High Definition Collaboration Systems," *Proceedings of the 2010 ASEE Annual Conference and Exposition*, Louisville, KY, June 20-23, 2010.
  136. X. Sun and E.J. Coyle, "Local Decisions and Optimal Distributed Detection in Mobile Wireless Sensor Networks," *Proceedings of the International Workshop on Wireless*

- Networks: Communication, Cooperation and Competition*, May 31st 2010, Avignon, France.
137. X. Sun and E.J. Coyle, "The Effects of Motion on Distributed Detection in Mobile Ad-Hoc Sensor Networks," *Proceedings of the 13th International Conference on Information Fusion*, Edinburgh, Scotland, 26-29 July, 2010.
  138. V. Kapnadak and E.J. Coyle, "Optimal Deployment Guidelines of Wireless Sensor Networks For Distributed Detection," *IEEE Conf. on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, Salt Lake City, Utah, June 27-30, 2011.
  139. X. Sun and E.J. Coyle, "Optimal Energy-Aware Distributed Estimation in Wireless Sensor Networks," *International Conference on Computer Communication Networks (ICCCN)*, Maui, Hawaii, July 31 - Aug 4, 2011.
  140. V. Kapnadak and E.J. Coyle, "Optimal Deployment of Sensors for Distributed Detection in Single-Hop Wireless Sensor Networks," *14<sup>th</sup> International Conference on Information Fusion*, Chicago, IL, July 5-8, 2011.
  141. R. Abler, E.J. Coyle, A. Kiopa, J. Melkers, "Team-based Software/System Development in a Vertically-Integrated Project-Based Course," *Proceedings of the 41<sup>st</sup> Annual ASEE/IEEE Frontiers in Education Conference*, Rapid City, SD, Oct. 12-15, 2011.
  142. M. Baxter, B. Byun, E.J. Coyle, T. Dang, T. Dwyer, I. Kim, C.-H. Lee, R. Llewallyn, and N. Sephus, "On Project-Based Learning through the Vertically-Integrated Projects Program," *Proceedings of the 41<sup>st</sup> Annual ASEE/IEEE Frontiers in Education Conference*, Rapid City, SD, Oct. 12-15, 2011.
  143. X. Sun and E.J. Coyle, "Optimal Distributed Estimation in Mobile Ad Hoc Sensor Networks," *2011 International Conference on Advanced Intelligence and Awareness Internet (AIAI 2011)*, Shenzhen, China, Oct. 27-30, 2011. (Best Paper Award)
  144. R. Abler, E.J. Coyle, R.A. DeMillo, E. Ivey, M. Hunter, "Team-based Software/System Development in the Vertically-Integrated Projects (VIP) Program," *2011 SSITE International Conference on Computers and Advanced Technology in Education (ICCATE 2011)*, Beijing, China, Nov 3-4, 2011.
  145. X. Sun and E.J. Coyle, "Optimal Distributed Estimation in Wireless Sensor Networks with Spatially Correlated Noise Sources," *Proceedings of the IEEE Wireless Communications and Networking Conference*, Paris, France, April 1-4, 2012.
  146. J. Melkers, A. Kiopa, R.T. Abler, E.J. Coyle, J.M. Ernst, J.V. Krogmeier, A. Johnson, "The Social Web of Engineering Education: Knowledge Exchange in Integrated Project Teams," *Proceedings of the 2012 ASEE Annual Conference and Exposition*, San Antonio, TX, June 10-13, 2012.
  147. S. Laitrakun and E.J. Coyle, "Power Allocation for Distributed Detection in a Multiple-Ring Cluster," *2012 IEEE Statistical Signal Processing Workshop*, Ann Arbor, MI, August 5-8, 2012.
  148. S. Laitrakun and E.J. Coyle, "Optimizing the Collection of Local Decisions for Time-Constrained Distributed Detection in WSNs," *Proceedings of the 32nd IEEE International Conference on Computer Communications*, Turin, Italy, April 14-19, 2013.
  149. S. Laitrakun and E.J. Coyle, "Reliability-Based Splitting Algorithms for Time-Constrained Distributed Detection in Wireless Sensors Networks," *Proceedings of the IEEE International Conference on Distributed Computing in Sensor Systems*, Cambridge, MA, May 21-23, 2013.

150. S. Laitrakun and E.J. Coyle, "The Use of Reliability-Based Splitting Algorithms to Improve Distributed Estimation in WSNs," *Proceedings of the Military Communications Conference (MILCOM 2013)*, San Diego, CA, Nov. 18-20, 2013.
151. E.J. Coyle, R.T. Abler, J. Melkers, and J. Howard, "Learning the Realities of the Research Process: Vertically-Integrated Project Teams," presented at the *Atlanta Conference on Science and Innovation Policy*, Atlanta, GA, Sept. 26-28, 2013.
152. D. Ferguson, M. Brain, J. Cawthorne, S. Condoor, E. Coyle, E. Fisher, C. Huellstrunk, W. Newstetter, D. Nino, I Sidhu, A. Shartrand, D. Wroblewski, "The Framework for Innovative/Entrepreneurial Engineering," *2014 ASEE Annual Conference and Exposition*, Indianapolis, IN, June 15-18, 2014.
153. J. Melkers, A. Kiopa, R.T. Abler, and E.J. Coyle, "Teaching and Catalyzing Innovation in Vertically-Integrated Projects (VIP) Program," abstract + poster, *2<sup>nd</sup> Annual STEM Education Research Expo*, Georgia Tech, March 5, 2014.
154. S. Laitrakun and E.J. Coyle, "Adaptive Reliability-Based Splitting Algorithms for Ordered Sequential Detection in WSNs," *IEEE Int'l Symposium on Personal, Indoor, and Mobile Radio Communication*, Washington DC, Sept. 2-5, 2014.
155. S. Laitrakun and E.J. Coyle, "Adaptive Reliability-Based Splitting Algorithms with Collision Inference for Sequential Detection," *Proceedings of the 2014 Military Communications Conference (MILCOM)*, Baltimore, MD, Oct. 6-8, 2014.
156. S. Laitrakun and E.J. Coyle, "Collision-Aware Decision Fusion in Distributed Detection Using Reliability-Splitting Algorithms," *Proceedings of the 2014 Military Communications Conference (MILCOM)*, Baltimore, MD, Oct. 6-8, 2014.
157. P.W. Garver, R.T. Abler, E.J. Coyle, and J. Narayan, "Comparisons of High Performance Software Radios with Size, Weight, Area and Power Constraints," *Ninth ACM International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization (WiNTECH 2014)*, Maui HI, Sept. 7, 2014.
158. E.J. Coyle, J.V. Krogmeier, R.T. Abler, A. Johnson, S. Marshall and B.E. Gilchrist, "The Vertically-Integrated Projects (VIP) Program – Leveraging Faculty Research Interests to Transform Undergraduate STEM Education," Presented at the *Transforming Institutions: 21st Century Undergraduate STEM Education Conference*, Indianapolis IN, Oct. 23-24, 2014.
159. S. Laitrakun and E.J. Coyle, "Collision-Aware Sequential Distributed Detection with Sensor Censoring in Random-Access WSNs," *12th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON 2015)*, Hua Tin, Thailand, June 24-27, 2015.
160. S Laitrakun and E.J. Coyle, "Collision-Aware Distributed Estimation in WSNs using Sensor-Censoring Random Access," *Proceedings of the 2015 Military Communications Conference (MILCOM)*, Tampa, FL, October 26-28, 2015.
161. P. Garver, R. Abler, E.J. Coyle, "Theory and Development of Cross-Layer Techniques for Localization in Environments with Extreme Emitter Densities," *Proceedings of the 2015 Military Communications Conference (MILCOM)*, Tampa, FL, October 26-28, 2015.
162. D. Phanish, P. Garver, G. Matakah, T. Landes, F. Shen, J. Dumond, R. Abler, D. Zhu, X. Dong, Y. Wang, and E.J. Coyle, "Design, Development and Deployment of a Sensor Network for Monitoring the Structural Behavior and Health of a Football Stadium," *Proceedings of the 2015 IEEE World Forum on the Internet of Things*, Milan, Italy, Dec. 14-16, 2015.

163. S. Laitrakun and E.J. Coyle, "Collision-Aware Composite Hypothesis Testing in Random-Access WSNs with Sensor Censoring," *19<sup>th</sup> Int'l Computer Science and Engineering Conference*, Chang Mai, Thailand, Nov 23-26, 2015.
164. E. Coyle, "The VIP Program: Integrating Research and Education to Achieve Systemic Reform of STEM Education," presented at the *2016 Southeast Symposium on Contemporary Engineering Topics (SSCET)*, Jackson, MS, August 26, 2016.
165. D. Phanish and E.J. Coyle, "Optimal multi-level clustering in multi-hop ad hoc and sensor networks," submitted to the *IEEE International Conference on Computer Communications (INFOCOM)*, Atlanta, GA, May 1-4, 2017.
166. P. Garver, E.J. Coyle, and R.T. Abler, "MAC Layer Assisted Localization in Wireless Environments with Multiple Sensors and Emitters," submitted to the *2017 Wireless Communications and Networking Conference*, San Francisco, CA, March 19-22, 2017.
167. E.J. Coyle, R.T. Abler, J. Sonnenberg-Klein, et.al, "Vertically Integrated Projects (VIP) Programs: Multidisciplinary Projects with Homes in Any Discipline," submitted to the *ASEE Annual Conference and Exposition*, Columbus, OH, June 25-28, 2017.
168. E.J. Coyle, et.al., "Vertically Integrated Projects (VIP) Programs: Variations in Implementation across Multiple Institutions," Panel for *ASEE Annual Conference and Exposition*, Columbus, OH, June 25-28, 2017.
169. J. Sonnenberg-Klein, R.T. Abler, and E.J. Coyle, "Multidisciplinary Vertically Integrated Teams: Social Network Analysis of Peer Evaluations for Vertically Integrated Projects (VIP) Program Teams," submitted to the *ASEE Annual Conference and Exposition*, Columbus, OH, June 25-28, 2017.

**Invited Presentations and Panels (Last ten years only):**

1. "The Engineering Projects in Community Service Program," *Bernard M. Gordon Prize Lecture*, the National Academy of Engineering, Washington DC, October 9, 2005.
2. "The EPICS Entrepreneurship Initiative," the NCIIA Idea-to-Venture Workshop at the Illinois Institute of Technology, Chicago IL, October 29, 2005.
3. "Research in Wireless Communications and Networking," Conference on Wireless Technologies, Indiana Innovation Network, Ball State University, Nov 9, 2005.
4. "Wireless Sensor Networks," CS Department, UCLA, January 12, 2006.
5. "The Vertically-Integrated Projects Program: Fully Integrating Undergraduate Education and Research," presented at the TKE-Sponsored National Symposium on Engineering Education, Tsinghua University, Beijing, China, Oct 30, 2006. This symposium was attended by approximately 150 faculty, academic administrators, and company representatives from around China.
6. "The Vertically-Integrated Projects Program: Fully Integrating Undergraduate Education and Research," Presented at five universities in Taiwan: National Chung Cheng University, Nan Kai Institute of Technology, National Chi Nan University, National I-Lan University, and National Dong Hwa University. I was an invited guest of the Ministry of Education, Taiwan.
7. "EPICS – Engineering Projects in Community Service," Presented to the *Council on Science and Technology*, Princeton University, Feb 15, 2007.
8. "Wireless Networks for Communication and Sensing: Football and Research," School of Electrical and Computer Engineering, Georgia Tech, Atlanta, GA, Feb 27, 2007.

9. "Wireless Networks for Communication and Sensing: Football and Research," Dept. of Electrical and Computer Engineering, Drexel University, Philadelphia, PA, March 2, 2007.
10. "Wireless Networks for Communications and Sensing," Distinguished Lecture Series, ECE, University of Delaware, March 5, 2007.
11. Wireless Networks for Communication and Sensing: Football and Research, Hong Kong University of Science and Technology," Hong Kong, China, March 16, 2007.
12. "EPICS – Creating Innovative Products for the Community," Undergraduate Education Distinguished Lecturer Series, Rice University, Houston, TX, March 26, 2007.
13. "Creating an Innovation Continuum in the Engineering Curriculum: EPICS and the EPICS Entrepreneurship Initiative," ECE, Georgia Tech, Atlanta, GA, April 4, 2007.
14. "Wireless Networks for Communication and Sensing: Football and Research," CS Dept., Clemson University, Clemson, SC, April 10, 2007. Clemson has started an eStadium project that they call "iTiger."
15. Organized Panel, "Creating Social Entrepreneurship Networks," *12'th Annual Conference of the National Collegiate Inventors and Innovators Alliance*, Dallas, TX, March 20-22, 2008.
16. "Wireless Networks for Communication and Sensing: Football and Research," Dept. of Electrical and Computer Engineering, Ohio State University, Dec. 6, 2007.
17. Session Moderator, "Social Entrepreneurship," 2008 NCIIA Conference, Dallas, TX, March 21, 2008.
18. Panel Member, "Creating Social Entrepreneurship Networks," 2008 NCIIA Conference, Dallas, TX, March 21, 2008.
19. Invited member of "111 Project" sponsored by the Chinese government to promote the development of research and education in engineering and computer science at Beijing Jiaotong University. Presentation: "Analysis, Design and Applications of Wireless Sensor Networks," May 24-26, 2008.
20. "Wireless and Sensor Networks: Sports and New Media," Invited talk presented to the College of Media and Design, Shanghai Jiaotong University, June 26, 2008.
21. "Wireless and Sensor Networks: Sports and New Media," Presented to the Organizers of Shanghai Expo 2010, Expo 2010 headquarters, Shanghai, China, June 27, 2008.
22. "Analysis, Design and Applications of Wireless Sensor Networks," College of Electrical, Information and Electronic Engineering, Shanghai Jiaotong University, Shanghai, China, June 23, 2008.
23. "The Vertically-Integrated Projects Program: Integrating Undergraduate Design and Graduate Research," College of Electrical, Information and Electronic Engineering, Shanghai Jiaotong University, Shanghai, China, June 23, 2008.
24. "The Vertically Integrated Projects Program: Integrating Undergraduate Design and Graduate Research," College of Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan, Sept. 8, 2008.
25. "A Wireless Application Developer's View of Mobile WiMAX (and other wireless protocols)," Invited Talk in the *WiMAX Workshop* within Mobility 2008, Ilan, Taiwan, Sept. 12, 2008.
26. "The Engineering Projects in Community Service Program," Universidad de Buenos Aires, Buenos Aires, Argentina, Nov. 10, 2008.
27. "The Engineering Projects in Community Service Program," Instituto Tecnológico de Buenos Aires, Buenos Aires, Argentina, Nov. 10, 2008.

28. "A Wireless Application Developer's Wish List," Invited dinner speaker at the *Workshop on Realtime Video Distribution over IP Networks*, Cisco Systems, Lawrenceville, GA, Nov. 13-14, 2008.
29. "The Future of Education & Research in the University: The Roles of Time, Process and Context," School of Engineering, Rice University, April 20, 2009.
30. "Bridging the Intellectual Divide: Integrating Research and Education via the VIP Program," Computer Science, Carnegie Mellon University, October 7, 2009.
31. "Social Networks and Broadband Networks: Making Wishes Come True?" Introductory talk for panel on the future of broadband networks, GCATT Broadband 2020, Georgia Tech, October 20, 2009.
32. "Bridging the Intellectual Divide: Integrating Research and Education in the Vertically Integrated Projects Program," presented to the College of Engineering's Advisory Board, Georgia Tech, May 2010.
33. "Bridging the Intellectual Divide: Integrating Research and Education in the Vertically Integrated Projects Program," University of Strathclyde, Glasgow, Scotland, July 29, 2010.
34. "Bridging the Intellectual Divide: Integrating Research and Education in the Vertically Integrated Projects Program," University of Strathclyde, Glasgow, Scotland, June 13, 2011. This talk was given on the first day of an invited two-week follow-up visit (see invited talk 37) to Strathclyde to assist with their launch of the VIP program.
35. "Distributed Estimation in Wireless Sensor Networks: Accounting for Energy Costs and Communication Constraint," Dept of Electrical and Electronic Engineering, University of Strathclyde, Glasgow, Scotland, June 16, 2011.
36. "Distributed Estimation in Wireless Sensor Networks: Accounting for Energy Costs and Communication Constraints," Dept. of Electrical and Systems Engineering, University of Pennsylvania, Sept. 27, 2011.
37. Invited Plenary Talk, "Wireless Sensor Networks: Where Are They?" delivered at the combined plenary sessions for the Int'l Conf. on Advanced Intelligence and Awareness Internet (AIAI 2011) and the Int'l Conf. on Broadband Networks and Multimedia Technology (BNMT 2011), Shenzhen, China, Oct. 30, 2011.
38. "Wireless Sensor Networks: Where Are They?" Tsinghua University Graduate School at Shenzhen, Shenzhen, China, Oct. 31, 2011.
39. "Clustering, Estimation, and Mobility in Wireless Sensor Networks: Accounting for Energy Costs and Communications Constraints," ECE, University of Manitoba, Winnipeg, Manitoba, CA, Nov 21, 2011.
40. Teaching & Catalyzing Innovation in the Vertically-Integrated Projects (VIP) Program," presented at the annual meeting of Georgia Research Alliance (GRA) Eminent Scholars, Atlanta, GA, October 3, 2013.
41. "Teaching & Catalyzing Innovation in the Vertically-Integrated Projects (VIP) Program," Distinguished Lecture Series, CSE, Florida International University, Miami, FL, October 2013.
42. "The Theory and Practice of Data Collection in Sensor Networks," Distinguished Lecture Series, Dept. of Computer Science and Engineering, Florida International University, Miami, FL, October 11, 2013.
43. "Teaching & Catalyzing Innovation in the Vertically-Integrated Projects (VIP) Program," EEE Department, University of Manchester, Manchester UK, June 17, 2014.

44. "Teaching & Catalyzing Innovation in the Vertically-Integrated Projects (VIP) Program," ECE Department, Howard University, Washington DC, Sept. 5, 2014.
45. "The Vertically-Integrated Projects (VIP) Program: Enabling Everyone to Participate in the Innovation Process," ISTE C Distinguished Lecture Series, Colorado State University, (ISTeC.ColoState.edu), Sept. 29, 2014.
46. "Adaptive Reliability-Based Splitting Algorithms for Ordered Sequential Detection in Wireless Sensor Networks," Electrical and Computer Engineering Dept., Colorado State University, Sept. 29, 2014.
47. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Invited Speaker at 25'th Annual ECE Day Celebration, Howard University, April 9, 2015.
48. "The Vertically-Integrated Projects (VIP) Consortium," *NAS Convocation on Integrating Discovery-Based Research into the Undergraduate Curriculum*, National Academy of Sciences, Washington, DC, May 11-13, 2015.
49. "Optimizing the Collection of Local Decisions for Time-Constrained Distributed Detection in WSNs," EEE Department, University of Strathclyde, Glasgow Scotland, UK, June 18, 2015.
50. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow Scotland, UK, June 19, 2015.
51. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Univ. of California - Davis, September 22, 2015.
52. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Renmin University in Beijing, China, November 10, 2015.
53. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Beijing University in Beijing, China, November 11, 2015.
54. Invited Member of a Panel on "Putting the "E" in STEM Education" at the 2016 Conference of the American Institute for Aeronautics and Astronautics. The panel was organized and moderated by Meredith Drosback, Assistant Director of the Science Division of the President's Office of Science and Technology Policy, <https://www.aiaa-scitech.org>, Thursday, January 7, 2016.
55. Invited Member of a Panel on "Innovations in Engineering Education," at the 2016 ASEE Engineering Dean's Institute, San Francisco, CA, 3/29 – 4/1, 2016. My intro talk was titled, "Systemic Reform of Engineering Education: The Vertically Integrated Projects (VIP) Consortium."
56. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Riga Technical University, Riga, Latvia, June 1, 2016.
57. "Systemic Reform of STEM Education: The Vertically Integrated Projects (VIP) Consortium," Univ. del Norte, Baranquilla, Columbia, June 23, 2016.

### **Consulting Activities:**

Information Science and Systems, Delco Electronics, General Dynamics, Texas Instruments, Los Alamos National Lab, Motorola, NSWC/Crane, International Technology Strategy Partners, Storage Network Industry Association, Raytheon, Goodyear Tire and Rubber Company.



### **Diversity Workshops (at Purdue University)**

1. Multicultural Diversity Forum, Schools of Engineering, 2-day workshop, March 1998
2. Gender Diversity Forum, Schools of Engineering, 2-day workshop, March 5-6, 2000
3. Continuing the Journey Forum, Schools of Engineering, 1-day workshop, March 6, 2001

### **Patents, Servicemarks, and Trademarks:**

1. U.S. Patent #4,868,773: (with J. P. Fitch, N. C. Gallagher, R. G. Harber, and S. C. Bass), "Filtering by Threshold Decomposition," 1990. Assignee: Purdue University
2. E.J. Coyle and L.H. Jamieson, *Servicemarks for the Engineering Projects in Community Service (EPICS) Program*, registered with the US Patent and Trademark Office on January 25, 2000; Certificate No. 2,310,451

### **Service within the School of Electrical and Computer Engineering at Purdue (1982-2008):**

1. PEEII - Faculty Representative for GTE, 9/83 - 9/84.
2. PEEII - Faculty Representative for TRW, 9/87 - 9/90.
3. PEEII - Faculty Representative for Northern Telecom, 9/90 - 9/92.
4. HKN Faculty Advisor, 1983-1986.
5. Technical Program Organizer for Spring 1989 PEEII Workshop.
6. Faculty Advisor for ECE Graduate Student Association, 8/92-8/98.
7. Faculty Advisor for ECE Student Advisory Committee, 10/96-12/97.
8. Member of the Qualifying Examination Committee, 2002-2004.
9. Chair of the Qualifying Examination Committee, 2004-2006.

### **Service within the School of Electrical and Computer Engineering at Georgia Tech (2008-):**

1. Member of the Promotion, Reappointment and Tenure Committee, 8/2010 – 7/2015
2. Member of the Graduate Committee, 8/2008-8/2010.
3. Arbutus Chair for the Integration of Research and Education, 1/2008-present.

### **Service to Georgia Tech (2008-):**

1. Member of the Search Committee for the Director of Undergraduate Research and Innovation, 2010.
2. Member of the "Service Learning and Legacy Project" Committee for the GT Strategic Planning Process, 2011-2012.
3. Member of the Institute Undergraduate Curriculum Committee, 2014-present.
4. Member of the Institute's Promotion, Reappointment and Tenure Committee, 7/2015-present.

### **Service to Purdue University and the State of Indiana (1982-2007):**

1. Member of the Working Group for the 21<sup>st</sup> Century Fund for Science and Technology, Spring 2000 – Spring 2003; This working group organized a lobbying effort for the successful (state) legislative renewal of the *21<sup>st</sup> Century Research and Technology Fund*.
2. Co-organizer (Lead organizers: John Schneider and Jeff Gunsher) of Purdue's Information Technology Workshops, October 4, 2000 and October 24, 2001. The purpose of the workshops was to make Purdue's capabilities in Information Technology Research better known throughout the state of Indiana. This effort resulted in a web site that

continues today to provide access to Purdue's IT researchers and the presentations from the workshop. Please see: <http://www.ecn.purdue.edu/ITresearch/>

3. Member of the organizing committee for the Research at Indiana display booth at Supercomputing 2000, 11/4/00-11/10/00, Dallas, TX.
4. Represented Purdue at and made a 15 minute speech as part of the public ceremony marking the launch of the \$2.5M Knowledge Projection research project involving Purdue, IU, NSWC/Crane and EG&G. This event was televised and was attended by members of the IN Congressional delegation.