



# Joseph T Wunderlich PhD

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LinkedIn: <http://www.linkedin.com/pub/dir/Joseph/Wunderlich> YouTube: [https://www.youtube.com/channel/UC\\_kM\\_k93zrelu40CVwuHQzq](https://www.youtube.com/channel/UC_kM_k93zrelu40CVwuHQzq)

## EDUCATION

### PhD in Electrical & Computer Engineering, University of Delaware 1996

Dissertation: *"Optimal kinematic design of redundant and hyper-redundant manipulators for constrained workspaces"*  
Advisor: Dr. Charles Boncelet (ECE and CS Professor, ECE Chair, Bell labs, DOD)  
Initial PhD research in developing a VLSI Neurocomputer

### M. Eng. in Engineering Science (Computer Design Track), Pennsylvania State University, Great Valley 1992

Thesis: *"A vector-register neural-network microprocessor design with on-chip learning"*  
Advisor: Dr. Chung Ho Chen (Unisys R&D, EE and CompEng Professor)

### Physics Graduate Studies, San Francisco State University 1988-89

### Urban & Environmental Design, University of California at San Diego, 39 credits of 2<sup>nd</sup> BS 1986-87

### BS in Architectural Engineering, University of Texas at Austin 1984

Thesis: *"Sensitivity analysis for project feasibility"* (using early PC's, Beta-test SuperCalc spreadsheet software, and Mainframe)  
Advisor: Dr David Ashley (also Stanford Engineering Professor, and President of Univ. of Nevada)

### Architectural Engineering, Pennsylvania State University 1979-82

*Of over 300 University credits total:*

**ELECTRICAL & COMPUTER ENGINEERING, and COMPUTER SCIENCE (3.99/4.00 GPA):** Robotics, Neural Networks, Artificial Intelligence; Special Purpose Computer Architectures; Parallel Processing; Advanced Computer Design; Digital Logic Design; Digital System Design; Switching Theory & Finite Automata; Embedded System Design & Assembly Language; Real-Time System Design; VLSI Circuit Design; Signals & Control Theory; Communication Theory; Computer Networking Theory; Device Physics; Integrated Circuit Fabrication; Fortran Programming, PL/X Programming, IBM S/390 Programming, Analog Circuit Design, Electrical Power & Motor Design. **Graduate-level PHYSICS & MATHEMATICS (4.00/4.00 GPA):** Atomic Physics & Quantum Mechanics, Analytical Mechanics, Numerical Methods, Linear Algebra, Physics Colloquiums (at SFSU - with UC Berkeley and Stanford Physics grad students); Master's Thesis included numerical methods applied to Neural Network learning in developing an entirely digital single-chip neurocomputer; PhD dissertation has 135 advanced calculus equations to design hyper-redundant robotic arms. IBM Research "Controlled Randomness" theory to test supercomputers with seven different correlated Random Number Generators.

**ARCHITECTURE & PLANNING (3.99/4.00 GPA):** Architecture Design Studios (Six Courses); Urban Design Studio; Urban Design History; Architectural History; Working Drawings; Site Design, Architectural Materials; Environmental Planning; Two courses in Global Urban Design and Planning (third-world emphasis). **ARCHITECTURAL & CIVIL ENGINEERING:** Illumination Engineering; Solar Design; Heating & Cooling Design; Power Distribution; Acoustics and Vibrations; Intro to AE, Geotechnical Analysis; Steel Structures; Concrete Structures; Wood Structures; Structural Analysis; Water & Waste-water Design; Surveying. **ENGINEERING SUPPORT:** Calculus-based Physics sequence; Calculus through Differential Equations; Two Chemistries; Biology; Technical Writing, Engineering Fundamentals Exam (EIT) passed in 1983 (for licensing). **MECHANICAL ENGINEERING:** Statics; Dynamics; Strength of Materials; Thermodynamics; Fluid Mechanics; Material Science; Analytical Mechanics. **MANAGEMENT & BUSINESS:** Contract Law & Specification Writing; Engineering Estimating; Engineering Cost Analysis; Project-Feasibility Simulation research; Micro Economics; Finance, Real Estate Appraisal; Principles 1&2; Practice; and Development.

## EMPLOYMENT

### ELIZABETHTOWN COLLEGE (Pennsylvania, 1999-present)

*A selective private National Liberal Arts College with 1700 students and ABET Accredited BS Computer Engineering, and Engineering*

#### Associate Professor of Engineering and Computer Science (Tenured 2005)

Computer Engineering Program Coordinator (1999-present), Architectural Studies Minor Coordinator (2012-present), Robotics & Machine Intelligence Lab Founder & Director (1999-present). Associate Chair of Engineering & Physics (2010-2016), Assistant Professor (1999-2005)  
Visiting Prof of Engineering (PhD course), Univ of Trento, Italy (2009)

### PURDUE UNIVERSITY (South Bend / West Lafayette, Indiana 1998,99)

#### Assistant Professor of Electrical & Computer Engineering Technology (Tenure-track)

### IBM S/390 HARDWARE DEVELOPMENT LAB (Poughkeepsie, New York, 6/96-7/98)

#### Researcher & Hardware Development Engineer (Advisory-Level)

Helped develop Symmetric Multi-Processor (SMP) mainframe-supercomputer architectures (jointly developed with IBM Germany) by engineering systems-level software and part of the SAK (Systems Assurance Kernel) operating system to "stress" features and force hardware failures through pseudo-random generation of correlated machine states and operating scenarios. Machines included 20 CPU's divisible into 15 logical partitions and scalable to 512 processors via a dynamic optical interconnect (IBM Parallel Sysplex). Engineered software to run in three environments: VLSI circuit simulation, prototype hardware test, and manufacturing. New 64-bit processing (address and data) required simulating 64-bit arithmetic and virtual-addressing to test simulated 64-bit prototype architectures using 32-bit machines. Prototypes were released as "IBM eServer zSeries" (now called zEnterprise). My research included branch-prediction verification strategies in a multiprocessor environment; and theory for hardware verification with seven correlated random number generators. My development projects included writing 20,000 lines of high-level language (PL/X) and S/390 assembly code including operating system application interfaces (API's). My RNG API code was also translated into C for IBM AS/400 minicomputers and RS-6000 (AIX type UNIX) workstations (the predecessor of POWER7 supercomputers like "Watson") requiring my supervising an engineer in Austin TX via the IBM intranet. Other projects included verification programs for cache coherency, virtual addressing, space-switching, linkage control, and 125 new IEEE floating-point instructions (to supplement IBM Hex floating-point). All 1400 IBM S/390 machine instructions were tested (including vector-register instructions for add-on vector-register unit). A patent process was initiated for my random number theory and API's

## **A.I. DUPONT CHILDREN'S HOSPITAL APPLIED SCIENCE & ENGINEERING LAB** (*Wilmington, DE 1/93-6/94*)

### **Assistant Researcher in Rehabilitation Robotics**

Worked with researchers from The University of Delaware, The University of Pennsylvania, Oxford University, and Cambridge University. Gave robotics and neural networks talks. Research on Human-Computer Interaction (HCI) for Assistive Technologies (robots)

## **PSI ENGINEERING** (*Lafayette, California 9/87-9/88*)

### **Architectural Engineer / Lead Designer**

Architectural, Environmental, Structural, and HVAC Engineering in San Francisco Bay area. Earned EPA certifications for Field Industrial Hygienist, and Architectural Abatement Designer. Supervised one junior engineer.

## **REAL-ESTATE INVESTORS** (*Austin, San Diego, 1/84-4/86*)

### **Director of Projects, Architectural Engineer/Designer**

Coordinated all architecture, engineering, and construction of \$90M (in 2017 dollars) of high-tech office park development (Several \$100M in Real Estate) including several large raised-floor computer facilities.

Contributed design to award-winning architecture. **Two major projects: 1984/85:** Helped Design &

Construct thirteen office buildings in Austin Texas (under a Registered Architect) - as "Project Manager"

/ Designer. **1985/86:** Helped Design & Construct 100,000sf hi-tech office complex in La Jolla, CA - as "Director of Projects" / Designer



## **PART-TIME & INTERMITTENT**

**Design/Builder, SELF-EMPLOYED TX, CA, PA, intermittent 1980 to present** See [ARCHITECTURE PORTFOLIO](#)

**Automation Consultant, RODEL SILICON SLURRY AND POLISHING OEM** Newark, Delaware, 1995,96

**Teaching Assistant, UNIVERSITY OF DELAWARE ELECTRICAL & COMPUTER ENGINEERING DEPT** 1995

(*created all labs, guest lectured*)

**Astronomy Lecturer, SAN FRANCISCO STATE UNIVERSITY PHYSICS DEPARTMENT** 1988,89

(*Planetarium lectures and laboratory projects*)

**Environmental Planner, SAN DIEGO COUNTY LOCAL AGENCY FORMATION COMMISSION** 1986,87

(*30 Hours/Week, reviewed Environmental Impact Reports and made recommendations to Planning Commission*)

**Construction Estimator, SELF-EMPLOYED Austin, TX** 1982,83,84

(*programmed HP-41C Calculator, and used early VisiCalc Spreadsheets to serve clients*)

**Research Assistant, UNIVERSITY OF TEXAS STRUCTURAL ENGINEERING TESTING LABS** Austin, TX 1982,83

(*Built electrical and mechanical testing equipment, and tested composite materials*)

## **HONORS**

2013 Key-note speaker and author: *Asian Conference on Sustainability, Energy & the Environment* (ACSEE 2013) Osaka, Japan

2004 2nd runner-up best paper "Novel Smart Engineering System Design Award" *Artificial Neural Networks in Engineering* 2004 St. Louis, MO.

1992 Pennsylvania State University Academic Excellence Award for graduating with 4.00 GPA

1986 Project nominated for annual San Diego *Architectural "Orchid Award"* -- Contributed Architectural Design to award-winning commercial / light-industrial multimillion dollar high-tech development project (Xscribe Corporation), La Jolla, CA.

1982 2nd Place, US Steel Architectural Design of Modular Habitats for Space, Pennsylvania State University competition

1979 3rd Place, Philadelphia Municipal Building design competition (entries from high schools throughout PA and surrounding states) Philadelphia, PA

## **INTERNATIONAL ACTIVITY**

2017 **AUSTRIA:** Invited Speaker for U.S. activities; The 2017 European Phoenix Contact Edunet Conference, Vienna

2017 **GERMANY & U.S.:** Joined the Phoenix Contact "*Edunet*," a [consortium of 90+ international Universities](#);

2012-16: **ITALY:** Reviewer of research in Italian Universities (Robotics, Machine Learning, Computer Architectures, Sustainability)

*The National Agency for Evaluation of Universities and Research Institutes (ANVUR)*,

2014: **ENGLAND:** Presented research in London

2013: **ENGLAND:** Organized [Cyber-Security Seminar](#) with US Ambassador John Craig.

2013: **JAPAN:** Presented research in Osaka (as a key-note speaker)

2012: **ARUBA, COLUMBIA, PANAMA, COSTA RICA:** Sailed from Florida to California through Panama Canal (attended related lectures on the way)

2011: **ITALY:** Authored [report assessing six Italian Universities](#) (for *BCA Study-Abroad Headquarters* which represents 125 colleges),

2011: **ITALY:** Presented research in Rome, and met with administration of *Sapienza U., U. Padua, U. Trento, and Pantheon Institute*

2009: **ITALY:** Visiting Professor of Engineering at *The University of Trento, Italy* (Taught [Ph.D. course in Advanced robotics](#))

2009: Created [Personal Language Translation site](#)

2008: **ITALY:** Accompanied student to Trento, Italy to present robotics research, established relationship with the *University of Trento*

2007: **ITALY:** Sent student to *The Italian Institute of Technology* to conduct research on my behalf

2005: **GERMANY & U.S.:** Established relationship with [Phoenix Contact](#) electronics.

2004: **ITALY:** Presented research in Genoa. Established relationship with *University of Genoa & The Italian Institute of Technology*

2003: **JAMAICA:** Accompanied student to Jamaica; We presented IEEE research papers on machine intelligence

2002: **JAPAN:** Sent student to Hiroshima to present our robotics research on Robotics for Search & Rescue

1985-87: **MEXICO:** Many trips to Mexico (various locations)

## **PROGRAMS DEVELOPED**

1999-present Continuous improvement of Computer Engineering Program (ABET Accredited in 2009 and 2015)

2014 Created Architectural Studies Minor [Links: Program, 4-year plans](#)

2011 Created Sustainable Design ("Environmental") Engineering for BS Engineering. (ABET Accredited in 2009 and 2015 with new concentration)

2013 Helped develop Computational Branch of Cognitive Science Minor (and teach capstone course)

2002 Helped develop Information Systems Major - Wrote e-commerce syllabi (CS310 and 410)

# PROGRAM ACCREDITATIONS

## 2015 BS Computer Engineering and BS Engineering re-accredited with no "deficiencies" or "weaknesses."

- o ABET BS Computer Engineering Evaluator: [James Michael Conrad PhD](#), Univ of North Carolina at Charlotte
- o ABET BS Engineering Evaluator: [Cynthia Barnicki PhD](#), Milwaukee School of Engineering
- o ABET Team Leader / Evaluator: [Paul J Benkeser PhD](#), Georgia Tech University

## 2009 BS Computer Engineering and BS Engineering accredited with no "deficiencies" or "weaknesses."

- o ABET BS Computer Engineering Program Evaluator: [Daniel J. Moore PhD](#), Rose-Holman Institute of Technology
- o ABET BS Engineering Evaluator: [Jane M. Fraser PhD](#), Colorado State University-Pueblo
- o ABET Team Leader / Evaluator: [Eugene Francis Brown PhD](#), University of Vermont

2007 [Proposal](#) to include Computer Science in Engineering accreditation

2001 ABET Program Evaluator training

1999: Purdue ABET mock Program Evaluator of Kokomo campus

1998 Purdue ABET Program-Evaluator training

# COURSES TAUGHT

## Elizabethtown College:

New courses created:

1. [Green Robotics, Automation, and Machine Intelligence](#) (EGR/CS434)
2. [Artificial Intelligence and Robotics](#) (EGR/CS434)
3. [Artificial Intelligence](#) (CS375)
4. [The Limits of Machine Intelligence](#) (FYS100)
5. [Green Architectural Engineering](#) (EGR343)
6. [Architectural Design Studio I & II](#) (EGR/ART499 A&B)
7. [Conceptual Architecture](#) (FYS100)
8. [Conceptual Architecture: from habitats to humanoids](#) (FYS100)
9. [Scientific Modeling for Sport](#) (FYS100)

Other courses (redesigned most, and continuously update active ones):

10. [Advanced Computer Engineering lecture and lab](#) (EGR/CS433)
11. [Digital Design II and Interfacing lecture and lab](#) (EGR/CS333)
12. [Computer Organization and Architecture - digital design I](#) (EGR/CS332)
13. [Microcomputer Architecture](#) (EGR/CS230)
14. [Engineering Senior Project](#) (EGR491/492, CS490)
15. [Computer Engineering Senior Project](#) (EGR494)
16. [Engineering Portfolio](#) (EGR400)
17. [Engineering Spring Seminar](#) (EGR396)
18. [Simulation](#) (CS344)
19. [Engineering Research in Robotics, AI, Sustainability, Architecture](#) (EGR280)
20. [Microcomputer Applications](#) (CS120)
21. [The Internet and the World Wide Web](#) (CS110)
22. Honors courses contracted periodically
23. Independent Study in Robotics and Machine Intelligence (EGR/CS485)

## University of Trento (Italy) Engineering Ph.D. Programs. New course created:

24. [Advanced Robotics with Application to Space Exploration](#)

## Purdue University:

25. [Analog Circuits I](#) (EET107)
26. [Digital Design II](#) (EET159)
27. [Microprocessors and Microcontrollers](#) (EET205)
28. [Electrical Power and Controls \(and Motors\)](#) (EET231)
29. [Professional Engineering Issues](#) (EET480)
30. [Senior Project Design I](#) (EET496)
31. [Senior Project Design II](#) (EET497)

## University of Delaware:

32. Digital Design *laboratories and guest lectures* (EE202)

## San Francisco State University:

33. Astronomy planetarium lecturer, and physics laboratory Lecturer (PHYS116)

## TEACHING PHILOSOPHY

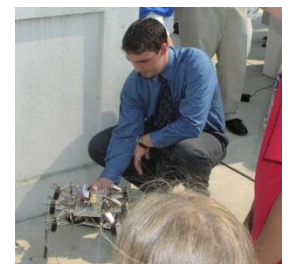
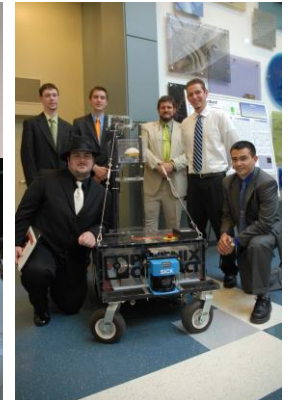
*I place equal emphasis on preparing students for employment and graduate school, and strongly promote creativity while expecting mastery of the rigor. I continuously update all courses; over 50% of lectures are not from texts, but from my experience and publications including engineering and architectural case-studies. I typically assign a semester research or design/build project and encourage students to find a topic they have a passion for -- one they can pursue over several semesters and into senior design, creating a "thread of research" over several courses (and breaks). In the classroom I maintain an atmosphere of mutual respect with a free exchange of ideas. I encourage debate because much learning comes from asking questions -- from the simplest computer conventions to the most sophisticated machine intelligence; this approach is common-place in architectural design studios. I incorporate Sustainable Design and Green topics into all courses, and incorporate Mind, Body, & Spirit discussion whenever possible -- in the hope of helping develop character. I teach the majority of my courses in my Lab/Studio (Robotics & Machine Intelligence Lab).*

## ASSESSMENT OF TEACHING

**Data for 491 students: I.D.E.A. teacher evaluation scores** consistently high for overall "Teacher Excellence"

Collected and posted on-line IDEA student [comments](#) (66)

Analyzed and graphed week-by-week [relative difficulty of my courses](#)





## PATENTS

- 1997 **"IBM S/390 architecture verification via controlled randomness"** theory & API-code (patent process began by IBM)
- 1991 Conducted patent search and filed patent disclosure for my neural network microprocessor design

## PEER-REVIEWED PAPERS

- [1] Wunderlich, J.T. and Wunderlich, J.J. (2014). **Crowdsourced Architecture and Environmental Design**. 2nd International Conference on Emerging Trends in Engineering and Technology (ICETET'2014) May 30-31, London (United Kingdom). [TALK PAPER](#)
- [2] Wunderlich, J.T. (2013). **Green robotics, automation, and machine intelligence; a new engineering course in sustainable design**. International Symposium on Green Manufacturing and Applications (ISGMA 2013), June 25-29, Oahu, Hawaii. [TALK PAPER](#)
- [3] Wunderlich, J.T. and Wunderlich, J.J. (2013). **Green architecture and environmental design using rapid-prototyping social-networking sandbox tools, followed by professional architectural software**. Asian Conference on Sustainability, Energy & the Environment (ACSEE 2013), June 6-9, Osaka, Japan. **[1 of 3 chosen from 250 for extended 45-minute key-note talk]** [TALK PAPER](#)
- [4] Wunderlich, J.T. (2012). **Creating an engineering program in sustainable design for a U.S. liberal arts college**. The 6th Int'l Conference on Design Principles and Practices, Los Angeles, CA.
- [5] Wunderlich, J.T. (2011). **Designing robot autonomy: how tightly should we hold the leash?** The 5th Int'l Conference on Design Principles and Practices, Rome, Italy. [TALK PAPER](#)
- [6] Painter, J. G., Coleman, D., Crouse, J., Yorgey, C., and Wunderlich, J.T. (2008) **Wunderbot 4 Intelligent Ground Vehicle Competition report**. Judged and published on-line by IGVC. [PAPER](#)
- [7] Painter J. and Wunderlich, J.T. (2008). **Wunderbot IV: autonomous robot for international competition**. In *Proceedings of the 12th World Multi-Conference on Systemics, Cybernetics and Informatics: WMSCI 2008, Orlando, FL*: (pp. 62-67). [PAPER](#)
- [8] Coleman, D. and Wunderlich, J.T. (2008). **O<sup>3</sup>: an optimal and opportunistic path planner (with obstacle avoidance) using voronoi polygons**. In *Proceedings of IEEE the 10th Int'l Workshop on Advanced Motion Control, Trento, Italy*. vol. 1, (pp. 371-376). IEEE Press. [PAPER](#)
- [9] Wunderlich, J.T. (2004). **Top-down vs. bottom-up neurocomputer design**. In *Intelligent Engineering Systems through Artificial Neural Networks, Proceedings of ANNIE 2004 Int'l Conference, St. Louis, MO*. H. Dagli (Ed.): Vol. 14. (pp. 855-866). ASME Press. **["Novel Smart Engineering System Design Award," 2nd runner-up best paper from over 300 submissions]** [PAPER](#)
- [10] Henderson, S., Shreshtha, S., Wunderlich, J.T. (2004). **A high speed AUV test platform** (submitted to military conference).
- [11] Wunderlich, J.T. (2004). **Simulating a robotic arm in a box: redundant kinematics, path planning, and rapid-prototyping for enclosed spaces**. In *Transactions of the Society for Modeling and Simulation International*: Vol. 80. (pp. 301-316). San Diego, CA: Sage Publications. [PAPER](#)
- [12] Wunderlich, J.T. (2004). **Design of a welding arm for unibody automobile assembly**. In *Proceedings of IMG04 Intelligent Manipulation and Grasping Int'l Conference, Genova, Italy*, R. Molfino (Ed.): (pp. 117-122). Genova, Italy: Grafica KC s.n.c Press. [PAPER](#)
- [13] Wunderlich, J.T. (2003). **Functional verification of SMP, MPP, and vector-register supercomputers through controlled randomness**. In *Proceedings of IEEE SoutheastCon, Ocho Rios, Jamaica*, M. Curtis (Ed.): (pp. 117-122). IEEE Press. [PAPER](#)
- [14] Wunderlich, J.T. (2003). **Defining the limits of machine intelligence**. In *Proceedings of IEEE SoutheastCon, Ocho Rios, Jamaica*, [CD-ROM]. IEEE Press. [PAPER](#)
- [15] Simione, D. and Wunderlich, J. T. (2003). **Development of an object-oriented, scalable, back-propagating neural network simulation**. In *Proceedings of IEEE SoutheastCon, Ocho Rios, Jamaica*, [CD-ROM]. IEEE Press.
- [16] Wunderlich, J.T. (2003). **An inside view on ABET engineering accreditor training**. In *Proceedings of 2003 ASEE Annual Conference & Exposition, Nashville, TN*: (session 3560), [CD-ROM]. ASEE Publications. [TALK PAPER](#)
- [17] Campos, D. and Wunderlich, J. T. (2002). **Development of an interactive simulation with real-time robots for search and rescue**. In *Proceedings of IEEE/ASME Int'l conference on Flexible Automation, Hiroshima, Japan*: (session U-007). ASME Press. [PAPER](#)
- [18] McClellan, E. F. and Wunderlich, J. T. (2002). **Devolving faculty development: establishing departmental-based peer review of teaching**. Workshop paper, *Professional and Organizational Developers (POD) Annual Conference*, Atlanta, GA.
- [19] Lister, M. and Wunderlich, J. T. (2002). **Digital communications for a mobile robot**. In *Proceedings of IEEE SoutheastCon, Columbia, SC*, [CD-ROM]. IEEE Press. [PAPER](#)
- [20] Wunderlich, J.T. (2001). **Simulation vs. real-time control; with applications to robotics and neural networks**. In *Proceedings of 2001 ASEE Annual Conference & Exposition, Albuquerque, NM*: (session 2793), [CD-ROM]. ASEE Publications. [PAPER](#)
- [21] Wunderlich, J.T. (1999). **Focusing on the blurry distinction between microprocessors and microcontrollers**. In *Proceedings of 1999 ASEE Annual Conference & Exposition, Charlotte, NC*: (session 3547), [CD-ROM]. ASEE Publications. [PAPER](#)
- [22] Wunderlich, J.T. and Boncelet, C.G. (1996). **Local optimization of redundant manipulator kinematics within constrained workspaces**. In *Proceedings of IEEE Int'l Conference on Robotics and Automation*, Minneapolis, MN: Vol. (1). (pp. 127-132). IEEE Press.
- [23] Wunderlich, J.T., S. Chen, D. Pino, and T. Rahman (1993). **Software architecture for a kinematically dissimilar master-slave telerobot**. In *Proceedings of SPIE Int'l Conference on Telemanipulator Technology and Space Telerobotics*, Boston, MA: Vol. (2057). (pp. 187-198). SPIE Press. [PAPER](#)

## OTHER WRITTEN WORKS

- [24] **ETOWN:** 2017 [Phoenix contact AXL/AXC PLC Manual](#) by D.Esteves and J.Wunderlich
- [25] **ETOWN:** 2017 [NanoLC Manual](#) by D.Esteves, C.Peters, and J.Wunderlich
- [26] **ETOWN:** 2017 [Raspberry Pi and ARM Microcontroller Assembly Language Manual and Labs](#) by D.Esteves and J.Wunderlich
- [27] **ETOWN:** 2014 Computer Engineering Self-Study, J. Wunderlich and T. Estrada
- [28] **ETOWN:** WebManual: [80251 Microcontroller Board and Software](#) by D. Campos, M. Klepeis, S. Sanko, M. Conlow, C. Janssen, J. Buxton, and S. Amir; J. Wunderlich editor (*EGR/CS333,433*). Last revised in 2015.
- [29] **ETOWN:** WebManual: [FPGA Board & Xilinx software](#) by C. Janssen, J. Kelly, D.Campos, M.Klepeis, S.Shrestha, S.Sanko and B. Moran; J. Wunderlich editor (*EGR/CS333,433*) [Last revised in 2013](#).
- [30] **ETOWN:** WebManual: [HTML Web-Page Design](#) by J. Wunderlich (*CS 110,120*). Last revised in 2010.
- [31] **ETOWN:** "Eclarion" professional development newsletter, April, 2002 "Etown Faculty Abroad," Editors: J.Wunderlich and N. Carlson.
- [32] **IBM:** Wunderlich, J.T. (1997). [Random number generator macros for the system assurance kernel product assurance macro interface](#). Systems Programmer's User Manual for IBM S/390 Systems Architecture Verification, Poughkeepsie, NY. ("*IBM Confidential*")
- [33] **IBM:** Wunderlich, J.T. (1996). [Branch-prediction verification of S/390 processors](#), Poughkeepsie, NY. ("*IBM Confidential*")
- [34] **UDEL:** Wunderlich, J.T. (1996). [Optimal kinematic design of redundant and hyper-redundant manipulators for constrained workspaces](#). *Ph.D. Dissertation*, University of Delaware. Advisor : Dr. Charles Boncelet
- [35] **UDEL:** Wunderlich, J.T., and Elias, J. (1993). [Design of an artificial dendritic tree VLSI microprocessor](#). U.Del. research report, 1993.
- [36] **PENNSYLVANIA STATE:** Wunderlich, J.T. (1992). [A vector-register neural-network microprocessor with on-chip learning](#). *Masters Thesis*, Pennsylvania State University. (*patent search conducted and patent disclosure filed*)

## WEB CONTENT CREATED

2017 [Sample lectures and custom lab manuals](#)  
2012-2016 Webmaster for [Engineering & Physics Department](#)  
2002 Dean of Faculty site

## ROBOTICS & MACHINE INTELLIGENCE LAB

- Engineering, Computing, and Architectural Programs; Over 200 robotics, machine intelligence, and architectural projects;
- Founded what became Elizabethtown Scholarship and Creative Arts Day (SCAD); To-date: 11 Robotics & Machine Intelligence symposiums: 5 Sustainability Symposiums, and 3 annual Architectural defenses
- 2013 Seminar on Cyber-Security with top U.S. and British scholars (*organized by Ambassador Craig and Etown office of Global Citizenship*)
- Regional Phoenix Contact PLC design competitions
- PLC's, Microcontrollers, FPGA's, Arduino's, Raspberry pies, IC's, Circuit Trainers, Matlab, LabVIEW, Revit, 3D printer, hydroponics, 1000 publications

## GRANTS

2003-present >**\$75,000** Gifts-in-kind of Computer Engineering and Architectural hardware and software  
2001-present >**\$15,000** to send students to present research in Italy, Japan, Jamaica, Michigan, North Carolina, and Florida  
2017 **\$10,400** Summer Research Grant for combining Programmable Logic Controllers (PLC's), Microcontrollers, and other electronics  
2017 **\$50,000+** in electronics from Phoenix Contact USA (advanced PLC's)  
2017 **\$80,000** in electronics from Phoenix Contact USA ([News Story](#))  
2016 **\$800** for student prizes, ECKey Contest (*wireless control of door locks*)  
2014 **\$15,000 (\$5,790 in awards)** Primary Investigator for [Mobile Wellness Truck Design](#) Grant/Joint-venture (*Student Designs, then Professional*)  
2014 **\$TBD** Primary Investigator for [Sierra Leone Health Clinic Design](#) Grant/Joint-venture (*Student Designs, then Professional*)  
2003-2008 >**\$100,000** fund-raising for WunderBot projects  
2011 **\$5,000** from Phoenix Contact for organizing annual meeting of 160+ international executives  
2008 **\$750** Summer Grant for conference travels  
2003 **\$1033** Summer Grant for workshops and conference travels  
2001 Robotics and Machine Intelligence Lab proposal (\$145,000 NSF proposal rewritten to help with \$22,000,000 of fund-raising for Master's Center)  
2001 **\$3500** of electronics (Diligent field-programmable gate array boards) and software (XILINX logic simulators)  
2001 **\$900** Summer Grant for ABET engineering Program Evaluator training course and conference travels  
2001 **\$1000** of robotic arms by Dennis Aldridge Company  
2001 **\$4000** of Image Processing Training by SVResearch for Etown students

## REFEREEING & EDITING

2012-2016 Reviewer of Research in Italian Universities *The National Agency for the Evaluation of Universities and Research Institutes (ANVUR)*, Italy (50 publications, and many grant-proposals reviewed)  
2012 Manuscript Referee *IEEE Transactions on Industrial Electronics*  
2011,12 Associate Editor *Design Principles and Practices, an International Journal*  
2011 Manuscript Referee *Int'l Federation of Automated Control Conf.*  
2006 Abstract Referee *IEEE American Controls Conference*  
2008 Manuscript Referee *Int'l ASME Dynamic Systems and Control Conf.*  
2005,06 Manuscript Referee *IEEE Transactions on Robotics*  
2004 Manuscript Referee *IEEE SECon Nat'l Conf*  
2002 Manuscript Referee *IEEE Frontiers in Education Nat'l Conf.*  
2001 Manuscript Referee *ASEE Nat'l Conf.*

## MAJOR-CONFERENCES & COMPETITIONS

2017 European Edunet Conference, Vienna, **Austria** (invited speaker)  
2014-present Judge (and organizer) for Regional and National Phoenix Contact Nanoline PLC (Programmable Logic Controller) design competitions **PA**  
2014 2nd *International Conference on Emerging Trends in Engineering and Technology*, London, **ENGLAND**. (Author, Speaker, Session Chair, judge)  
2014 Judge for Mobile Wellness Truck Designs (over \$5500 in student prizes) **PA**  
2013 *International Symposium on Green Manufacturing and Applications* (ISGMA 2013), June 25-29, Oahu, **HAWAII** (Author, Speaker)  
2013 *Asian Conference on Sustainability, Energy & the Environment* (ACSEE 2013), June 6-9, Osaka, **JAPAN** (Author, a key-note Speaker)  
2012 Judge for Central-Pennsylvania United States Green Building Council Green-buildings awards **PA**  
2012 6th *Int'l Conference on Design Principles and Practices*, Los Angeles, **CA** (Author, Virtual Presentation)  
2011 5th *Int'l Conf. on Design Principles and Practices*, Rome **ITALY** (Author, Speaker)  
2008 12th *World Multi-Conf. on Systemics, Cybernetics and Informatics*, Orlando, **FL** (Co-Author, Co-Speaker, Session Chair)

2008 *Intelligent Ground Vehicle Competition*, Detroit, **MI** (Faculty Advisor, Coach)  
2008 *IEEE 10th Int'l Workshop on Advanced Motion Control*, Trento, **ITALY** (Co-Author, Attendee)  
2006 *Intelligent Ground Vehicle Competition*, Detroit, **MI** (Faculty Advisor, Coach)  
2004 *ANNIE 2008 Artificial Neural Networks in Engineering*, St. Louis, **MO** (Author, Speaker, Session Chair, Paper Award)  
2004 *IMG04 Int'l Conf. on Intelligent Manipulation and Grasping*, Genoa, **ITALY** (Author, Speaker, Session Chair)  
2004 *Intelligent Ground Vehicle Competition*, Detroit, **MI** (Faculty Advisor)  
2003 *ASEE Nat'l Conf.*, Nashville, **TN** (Author, Speaker)  
2003 *IEEE SECon Nat'l Conf.*, Ocho Rios, **JAMAICA** (Author, Speaker, Session Chair)  
2002 *Professional and Organizational Development (POD) Annual Conf.*, Atlanta, **GA**. (Speaker, Workshop co-organizer)  
2001 *Project Kaleidoscope*, Snow Bird, **UT** (Participant)  
2001 *ASEE Nat'l Conf.*, Albuquerque, **NM** (Author, Speaker, Session Chair)  
1999 *ASEE Annual Conference & Exposition*, Charlotte, **NC** (Author)  
1996 *IEEE Int'l Conf. on Robotics and Automation*, Minneapolis, **MN** (Author, Speaker)  
1993 *SPIE Int'l Conf. on Telem manipulator Technology and Space Telerobotics*, Boston, **MA** (Author, Speaker)

## MEETINGS & SYMPOSIA

1989-present Periodic IEEE and ASME regional meetings, **PA**2015 *GreenCon2015*, Franklin & Marshal College, **PA** (Speaker)  
2014 American Society of Quality (ASQ), **PA** (Speaker)  
2013 *GreenCon2013*, Dickinson College, **PA**  
2001 *Office XP Symposium*, Valley Forge, **PA**  
1992 *Hewlett Packard High-Speed Digital Symposium*, King of Prussia, **PA**  
1986 *Technical Specification Writers Conf.*, San Diego, **CA**  
1986 *Geotechnical Analysis Conf.*, San Diego, **CA**

## WORKSHOPS

2015 (18 hours), U.S. Cyber-consequences Unit, Arlington, **VA**  
2007 Pennsylvania industry-collaboration grants workshop, **PA**  
2007 NSF and NIH grant-proposal writing Nashville, **TN**  
2003 Developing a Comprehensive Faculty Evaluation System, Atlanta, **GA**  
2002 Creativity workshops at Professional & Organizational Developers Atlanta, **GA**  
2001 Teaching excellence at Project Kaleidoscope, Snow Bird, **UT**  
1999-present Etown: Grant Writing, Book Publishing, Campus Internationalization, Student Ethics, First Year Seminars, Teaching-Load, etc **PA**  
1998 Learning, whose responsibility, is it? South Bend, **IN**

## SOCIETIES (INTERMITTENT SINCE 1980'S)

- IEEE Institute of Electrical and Electronics Engineers (IEEE)
- American Society of Engineering Educators (ASEE)
- Professional and Organizational Development Network (POD)
- United States Green Building Council (USGBC); Construction Specifier's Institute (CSI)

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## COMMITTEES

2018- Facilities, Planning, and Construction  
2017/18 Tenure-Track Computer Scientist Search [ ]  
2015/16 Sustainability Strategic-Planning ([REPORT](#))  
2015/16 Tenure-Track Computer Scientist Search [*Ting Gu*]  
2014/15 Tenure-Track Computer Scientist Search  
2014/15 Ware Lecture Steering  
2012/13 Sustainability Strategic-Planning ([REPORT](#))  
2012 Strategic Planning Committee on Multi-cultural Diversity  
2011 Tenure-Track Civil Engineer Search [*B.Read*]  
2011 International Committee (w/ Ambassador John Craig)  
2010 Tenure-Track Mechanical Engineer Search [*S.Atwood*]  
2010 Tenure-Track Electrical Engineer Search [*T.Estrada*]  
2009 Tenure-Track Computer Scientist Search [*B. Wittman*]  
2007 Psychology Councilors Search [*L. Harker and K. Sagun*]  
2006 Dean of Faculty Search [*C. Bucher*]  
2006 Faculty Resources  
2002 Dean of Faculty Search, *Secretary*, [*M. Pennington*]  
2002 Director of Facilities and Construction Search [*J. Metro*]  
2002 Tenure-Track Electrical Engineer Search [*I. Grave, T.McBride*]  
2001- 04 Chair or Co-Chair, Professional Development: Faculty grant and sabbatical proposals, introduced faculty peer-mentoring, departmental Peer-Review Plans, faculty orientations, "Eclarion" [newsletter](#)  
2000 Tenure-Track Mechanical Engineer Search [*K. DeGoede*]  
2000 Student Center [Preliminary Architecture](#)  
1998 Purdue Senior Projects  
1998 Purdue Microprocessor

## OTHER SERVICE

1999-present Up to 31 advisees per year, plus "Called to Lead" and "Emerging Scholar" mentoring; Special mentoring for international and other underrepresented students, including many activities (some off-campus); Peer-mentoring of Faculty, and some staff; [Robotics and Machine Intelligence](#) club Advisor; Career planning, security clearances, editing résumés; Numerous field trips Volunteered in local elementary schools (2005-2008); Faculty Mentor for Men's Basketball team (2002-2016); [Judo](#) club Advisor and Coach (2002-2014); Taught overload without additional pay (1999-2006); Donated most of professional development funds (\$1000 per year) to student robotics projects for first five years at Etown (1999-2005); No start-up funds available in 1999; helped change this for new faculty. Homeschooled my Son Joseph (10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup> Grade), then gave special mentoring to other homeschooleders