

Joseph T. Wunderlich Ph.D.

Cell: 717-368-9715 Office: 717-361-1295 Email: Wunderjt@etown.edu
Website [YouTube Channel](#) [A&E Portfolio](#) [Linkedin](#)



SKILLS

- Neural network processor design, Digital & embedded systems design, Supercomputer design; Robotics for medical applications, factory automation, and competitions; Software engineering of simulations, real-time systems, and an IBM quality-control OS for supercomputers; Coding in high-level and assembly languages; Game design & virtual reality
- A&E Design and development of buildings, towns, and campuses; A&E Structural, Lighting, Acoustical, Environmental, Architecture theory, World architectures, Frank Lloyd Wright, 3D modeling; A&E Project feasibility financial analysis; A&E Negotiating and coordinating multi-million-dollar projects
- Quality control in both Hi-Tech and A&E
- College & University Teaching and Mentoring (2500 students, 42 different courses, several new programs)
- Many International Collaborations

PROFESSOR Employment (fulltime 1998-present)

Elizabethtown College (mostly) and Purdue University; also U. of Trento in Italy

- **25 YEARS full-time** teaching, program coordination, and accreditations -- including 42 Hi-tech and Architecture courses; Helped merge programs and departments into new [School of Engineering, Math, and Computer Science](#). Coordinated, judged, presented, and published in architecture and Hi-tech worldwide; Organized 26 symposiums; On 30 committees including an A&E & real estate development committee for projects up to \$40,000,000.

IBM SUPERCOMPUTER R&D, and MEDICAL & INDUSTRIAL ROBOTICS Employment (1990's)

- **4 YEARS full-time** including supervising junior engineers on IBM supercomputer R&D, and Quality-Control/Verification (IBM Patented my Research); Medical robotics at AI Dupont Children's Hospital; and Industrial robotics consulting.

ARCHITECTURE & URBAN DESIGN Employment (mostly 1980's)

- **4 YEARS full-time**, 30+ yrs. part-time, PA, CA, TX. Negotiated & coordinated all A&E & construction of \$100,000,000 of hi-tech & manufacturing facilities in TX & CA (\$200,000,000 of Real Estate); created small companies. Then on San Diego County Planning Commission staff.

PROFESSIONAL LICENSING

- Education and work qualify for both Professional Engineering and Professional Architectural licensing. Also two EPA Certifications ("Field Industrial Hygienist" for sampling hazardous materials" and "Architectural Abatement Designer"), and coursework & experience (Real-Estate Development) towards a California Real Estate Broker license.

INTERNATIONAL INITIATIVES

- 14 International trips including relationships with Italian government and seven Italian Universities. Europe, Central & South America, Japan; First U.S. Professor in Phoenix Contact Edunet, with over 100 Universities in 29 Countries. Some proficiency speaking Italian.

NOTABLE ACCOMPLISHMENTS AS A STUDENT

- 1980's: Undergrad **estimating and financial analysis** research, and an estimating business (*which led to working for Developers*)
- 1990's: Designed two **Neural Network Processors** (*and later won an award for a publication comparing them*)
- 1990's: Design of **Robots** for industrial and medical applications

YOUTUBE CHANNEL

(143 RECORDED LECTURES)



Joseph Wunderlich

@josephwunderlich504
50 subscribers



INTRO Hi-Tech LECTURES
(egr/cs230)



Advanced Hi-Tech LECTURES



Architecture LECTURES



HI-TECH STUDENT WORKS



Architecture STUDENT WORKS

WEBSITE

(SEVERAL 100 PAGES)



EDUCATION

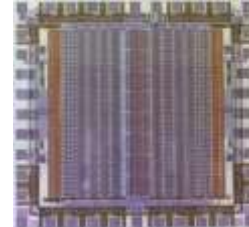


PhD Electrical Engineering, University of Delaware 1996

Research Group: **Computer Engineering**

Dissertation: "**Optimal kinematic design of redundant and hyper-redundant manipulators for constrained workspaces**"

Advisor: Dr. Charles Bonchelet (ECE & CS Professor, ECE Chair, Bell labs, DOD), *Initial research developing 2nd Neural Network processor*



Masters of Engineering in Engineering Science, Computer Design track Penn State, Great Valley 1992

Thesis: "**A vector-register neural-network microprocessor design with on-chip learning**" (*filed Patent Disclosure Document*)

Advisor: Dr. Chung Ho Chen (Unisys R&D, Electrical and Computer Engineering Professor)

NOTE: *This program split in the 2000's into new Masters degrees in Systems Engineering and Software Engineering*



Physics Graduate Studies, San Francisco State University 1988-89



Urban & Environmental Design, University of California San Diego (UCSD) 1986-87

39 credits of 2nd BS program



BS Architectural Engineering, University of Texas at Austin 1984

Thesis: "**Sensitivity analysis for project financial feasibility**" (*using early PC's, Beta-test SuperCalc spreadsheets, and Mainframe*)

Advisor: Dr David Ashley (also Stanford Engineering Professor, and President of Univ. of Nevada)



Architectural Engineering, Pennsylvania State University, Hazelton and University Park 1979-82

ELECTRICAL & COMPUTER ENGINEERING, and COMPUTER SCIENCE COURSES: *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, PLX Programming, IBM S/390 Programming, Analog Circuit Design, Electrical Power & Motor Design. Graduate-Level Physics & Math: *Quantum Mechanics; Analytical Mechanics; Numerical Methods; Linear Algebra; Physics Colloquiums (SFSU, UC Berkeley, and Stanford students)**

ARCHITECTURAL and URBAN DESIGN COURSES (and supporting courses): *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 & Planning (third-world emphasis). Architectural & Civil Engineering courses:* *Illumination Engineering; Solar Design; Heating & Cooling Design; Power Distribution; Acoustics & Vibrations; Intro to AE, Geotechnical Analysis; Steel Structures; Concrete Structures; Wood Structures; Structural Analysis; Water & Waste-water Design; Surveying. Math & Physics:* *Calculus-based Physics sequence (three courses); Calculus through Differential Equations; Two Chemistries; Biology; Technical Writing; Mechanical Engineering:* *Statics; Dynamics; Strength of Materials; Thermodynamics; Fluid Mechanics; Material Science. Management & Business:* *Contract Law & Specification Writing; Engineering Estimating; Engineering Cost Analysis; Project-Feasibility Simulation research; Microeconomics; Finance; Real Estate Appraisal; Real Estate Principles 1&2; Real Estate Practice. Engineering Fundamentals Exam (EIT) passed in 1983 (for licensing).*

EMPLOYMENT

ELIZABETHTOWN COLLEGE *(Pennsylvania, 1999-present)*

A selective private National Liberal Arts College with 1700 students and ABET Accredited Engineering

Associate Professor of Engineering & Computer Science (and Architecture)

- Visiting Professor of Engineering (PhD course), U. of Trento, Italy (2009)
- First Engineering Professor to earn Tenure, 2005
- Assistant Professor (1999-2005)
- 1999-present: **Computer Engineering Coordinator**
- 2012-present: **Architectural Studies Coordinator**
- 1999-present: **Robotics & Machine Intelligence Lab (and Architecture Studio) founder & Director**
- 2010-2016: **Associate Chair of Engineering & Physics Department**

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 for QUALITY-CONTROL / VERIFICATION to "stress" features and force hardware failures through pseudo-random generation of correlated machine states and operating scenarios. Machines included 20 multicore processors (18 CPU and 2 I/O); divisible into 15 logical partitions and scalable to 512 processors to fit inside a \$1M vending-machine size box; Scalable/connectable to other mainframes & supercomputers 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 "IBM Z"). My research included microprocessor 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 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 *(Wilmington, Delaware 1/93-6/94)*

PhD-student Researcher in Assistive Robotics

Worked with researchers from The University of Delaware, The University of Pennsylvania, Oxford, and Cambridge Universities. Gave robotics and neural networks talks. Researched Human-Computer Interaction (HCI) for Assistive Technologies (robots) for disabled children. Implemented computer hardware and software.

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

Architectural Engineer / Lead Designer

Architectural, Environmental, Structural, and HVAC Engineering in San Francisco area. Earned EPA certifications (three weeks of courses in Lawrence, Kansas) for Field Industrial Hygienist, and Architectural Abatement Designer. Supervised one junior engineer.

SAN DIEGO COUNTY Local Agency Formation Commission (LAFCO) 1986,87

Environmental Planner

Thirty Hours/Week, reviewed Environmental Impact Reports and made recommendations to elected Planning Commission.

REAL-ESTATE DEVELOPERS *(Austin TX, San Diego CA, 1/84-4/86)*

Director of Projects, Architectural Engineer/Designer

Coordinated all architecture, engineering, and construction of ~\$100M of high-tech office park development (Several \$100M in Real Estate) including several large raised-floor computer facilities. Contributed design to award-winning architecture. **Largest Developments: 1984/85:** Helped design & construct thirteen office buildings in Austin Texas, including two IBM S/390 raised-floor computer facilities - as "Project Manager" / Designer. **1985/86:** Helped Design & Construct 100,000sf hi-tech office complex for a computer company in La Jolla, CA as "Director of Projects", plus simultaneously six other large projects, with and one managed by my own property management company.



PART-TIME & INTERMITTENT

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

Automation Consultant, RODEL SILICON-WAFER 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 related physics lab projects

Construction Estimator, SELF-EMPLOYED Austin, TX 1982 to 84 → Programmed HP-41C, and used early VisiCalc Spreadsheets to serve clients

Research Assistant, UNIVERSITY OF TEXAS STRUCTURAL ENGINEERING TESTING LABS Austin, TX 1982,83 → Built equipment, tested composite materials

HONORS

- 2017 Invited speaker at 2017 Edunet conference, Vienna Austria (only U.S. citizen of 19 countries and 29 Universities represented)
- 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 Penn State Academic Excellence Award for graduating with 4.00 GPA
- 1986 Project nominated for annual San Diego "Orchid Award" -- contributed architectural design to award-winning mixed-commercial / light-industrial multimillion-dollar high-tech development project (Xscribe Computer 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 (entries from high schools throughout PA and surrounding states), Philadelphia. PA

INTERNATIONAL ACTIVITIES

- 2003-present: Many collaborations with [U.S. Ambassador John Craig](#)
- 2017 **AUSTRIA:** Invited Speaker, 2017 Edunet Conference, Vienna (to representatives from 19 countries)
- 2017 **ITALY:** Viewed dozens of student architectural projects, and given private tour of national Architecture archives, U. of Venice
- 2017 **GERMANY:** Finalized officially joining the "Edunet," a [consortium of 150+ international Universities](#) (Initial invitation in 2009)
- 2012-16 **ITALY:** The National Agency for Evaluation of Universities and Research Institutes (ANVUR)
 - Paid position with the Italian Government as a Peer-reviewer of research in Italian Universities
 - 50 journal publications, and 8 grant-proposals reviewed
- 2013 **ENGLAND:** Presented combined architecture & hi-tech research in London
- 2014 **ENGLAND:** Organized [Cyber-Security Seminar](#) in U.S. with US Ambassador John Craig
 - Three top international experts. including one from **British Embassy**
- 2013 **JAPAN:** Key-note speaker in Osaka to present combined architecture & hi-tech research
 - Also architecture research in Kyoto, Narita, and Osaka
- 2012 **ARUBA, COLUMBIA, PANAMA, COSTA RICA:** Semi-academic cruise from Florida to California (attended many related lectures)
- 2011 **ITALY:** Authored [report assessing six Italian Universities](#) (for BCA Study-Abroad Headquarters which represented 125 colleges)
- 2011 **ITALY:** Presented research in Rome. Also interviewed administration of Sapienza U., U. Padua, U. Trento, and Pantheon Institute
- 2009 **ITALY:** Visiting Professor of Engineering at U. of Trento, Italy ([Ph.D. course in Advanced robotics](#))
- 2009 **ITALIAN** (mostly), **JAPANESE**, and some **GERMAN** and **FRENCH:** [Personal Language Translation site](#) (1000's of words)
- 2008 **ITALY:** Accompanied student to Trento to present robotics research, established relationship with U. of Trento
- 2007 **ITALY:** Sent student to Italian Institute of Technology to conduct research on my behalf
- 2005 **GERMANY & U.S.** Began relationship with [Phoenix Contact](#) electronics (German International HQ, and USA HQ).
- 2004 **ITALY:** Presented robotics research in Genoa. Established relationship with U. of Genoa & Italian Institute of Technology
- 2003 **JAMAICA:** Presented research on machine intelligence and supercomputer design
- 2002 **JAPAN:** Sent student to Hiroshima to present our robotics research on search & rescue
- 1980's **MEXICO:** Many trips to various locations

TEACHING

Teaching Philosophy

*I place equal emphasis on preparing students for employment and grad school, and strongly promote creativity. Continuously update all courses. Most lectures are not from textbooks, but from my experience and publications, including engineering and architecture case-studies. Typically assign a semester research or design/build project and encourage students to find a topic they have a passion for -- one they could pursue over several semesters and into senior design, creating a "thread of research" over several courses (and breaks). Maintain a classroom atmosphere of mutual respect with a free exchange of ideas. Encourage debate -- 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. Incorporate Sustainable Design and Green topics whenever possible, and help develop character. **I empower my students with challenging goals and individual responsibilities.** I teach the majority of my courses in my Lab/Studio.*

Student Evaluations

- **2004/05** [491 Students Evaluations](#) for Tenure (*First Elizabethtown College Engineering Professor to Earn Tenure*)
 - [Sixty-six Student Comments](#)
- **2020/21** [Evaluations and Comments](#) (i.e., College collects one semester per year for tenured Professors)

NEWER COURSES:

1. EGR/ART 495(499A) "**Architectural Design Studio I**" *Etown* (RESULTS)
2. EGR/ART 496(499B) "**Architectural Design Studio II**" *Etown* **SLE Signature Learning Experience** (RESULTS)
3. A EGR200 "**Engineering Research**" in Architecture (2 credits) *Etown* (RESULTS)
4. B EGR280 "**Engineering Research**" in Architecture (4 credits) *Etown* (RESULTS)
5. EGR/CS434 "**Robotics & Machine Intelligence**" *Etown* (FINAL EXAM 2017 2019)
6. EGRxxx PhD Course "**Advanced Robotics with Applications to Space Exploration**" U. Trento, Italy
7. EGR/CS485 "**Independent Study in Robotics and Artificial Intelligence**" *Etown*
8. EGR/CS 430/433 "**Parallel Processing / Advanced Computer Engineering LECTURE & LAB**" *Etown* (FINAL 2022)
9. EGR401(491),402(492),CS490 "**Engineering (and Computer Science) Senior Project**" *Etown*
10. EGR280 "**Engineering Research**" (General) (0 to 4 credits) *Etown*
11. HONxxx "**Honors Thesis**" *Etown*
12. EGR400 "**Engineering Portfolio**" (Old Version) *Etown*
13. ART370 "**Architectural Design Theory**" *Etown*
14. ART371 "**Architectural Materials & Methods**" *Etown*
15. ART/SOC371 "**Frank Lloyd Wright**" *Etown*
16. EGR343/353 "**Green Architectural Engineering**" *Etown* (Fall 2014 SFW Center & Africa Health Clinics): (RESULTS)
17. EGR/CS330 "**Digital Design and Embedded Systems LECTURE & LAB**" *Etown* BY INTENSELY COMBINING:
18. EGR/CS333 "**Digital Design II, Assembly Language, and Interfacing LECTURE & LAB**" *Etown* (FINAL 2017 2019)
19. EGR/CS332 "**Digital Design I**" *Etown*
20. ART280 "**World Architecture**" *Etown*
21. EGR/CS230 "**Computer Architecture and Hi-Tech Fundamentals**" *Etown* (FINAL 2017 2019 2022-PDF,MP4)
22. CS170 "**Game Design and Virtual Reality**" *Etown*
23. FYS100 "**Organic Architecture and Frank Lloyd Wright**" *Etown* (Conceptual Architecture)



OLDER COURSES:

24. EGR494 "**Computer Engineering Senior Project**" *Etown*
25. EGR/CS434 "**Artificial Intelligence and Robotics**" *Etown* (FINAL 2009)
26. EGR396 "**Spring Seminar**" *Etown*
27. CS375 "**Artificial Intelligence**" *Etown*
28. CS344 "**Simulation**" (Modeling Physical Systems) *Etown*
29. CS120 "**Microcomputer Applications**" *Etown*
30. CS110 "**The Internet and the World Wide Web**" *Etown*
31. FYS100 "**Conceptual Architecture; from Habitats to Humanoids**" *Etown*
32. FYS100 "**Scientific Modeling for Sport**" *Etown*
33. FYS100 "**The Limits of Machine Intelligence**" *Etown*
34. EET497 "**Senior Project Design II**" *Purdue*
35. EET496 "**Senior Project Design I**" *Purdue*
36. EET480 "**Professional Engineering Issues**" *Purdue*
37. EET231 "**Electrical Power and Controls (and Motors)**" *Purdue*
38. EET205 "**Microprocessors and Microcontrollers**" *Purdue*
39. EET159 "**Digital Design II**" *Purdue*
40. EET107 "**Analog Circuits I**" *Purdue*
41. CPEG202 "**Digital Design**" U. Delaware TA and Guest Lecturer
42. ASTR116 "**Astronomy Laboratory and Planetarium Lectures**" *San Francisco State*

[ARCHITECTURE PAGE](#) (with links to lecture series'):

STUDENT DESIGNS				STUDIO		VIRTUAL REALITY		2020 Graduates	
<p>2019 Architecture Theory LECTURE SERIES pdf PPTX YouTube</p>		<p>2018 Frank Lloyd Wright LECTURE SERIES pdf PPTX-w/audio YouTube Upcoming Book Excerpt</p>		<p>2019 Frank Lloyd Wright 31 sites visited in Chicago-Land YouTube</p>		<p>2013 Japanese Urban Design and Architecture pdf PPTX-w/audio MP4 YouTube</p>		<p>Skeleton Beneath The Skin pdf PPTX-w/audio MP4 YouTube</p>	
<p>Lighting Design pdf PPTX-w/audio MP4 YouTube</p>		<p>Skyscrapers pdf PPTX MP4 YouTube</p>		<p>2006-2015 Intro to Architecture Theory pdf, PPT</p>		<p>JT Wunderlich Italy Travels (six trips)</p>		<p>JT Wunderlich Portfolio pdf, PPTX-w/audio MP4, YouTube</p>	
<p>Field Trip to Frank Lloyd Wright's Falling Water and Kentsuck Knob</p>		<p>Mansions & Inspirations pdf, PPTX-w/audio MP4, YouTube</p>		<p>Roman A&E pdf, PPTX-w/audio MP4, YouTube</p>		<p>Present Pennsylvania Architecture</p>			

SAMPLE LECTURES



Robotics a machine intelligence lab since 1999

https://www.youtube.com/watch?v=Jk3kZ8qyS2M&list=PLK3MJsXEYEQIGw3tmlkjsBfZ49rr_GAmv&index=1



Draft book chapter on machine learning

https://www.youtube.com/watch?v=A-sbygSrZys&list=PLK3MJsXEYEQIGw3tmlkjsBfZ49rr_GAmv&index=2&t=3s



Advanced computer engineering lecture

https://www.youtube.com/watch?v=B1yyD8PDI2w&list=PLK3MJsXEYEQIGw3tmlkjsBfZ49rr_GAmv&index=5



Frank Lloyd Wright Book in Progress

<https://www.youtube.com/watch?v=rMOroJhMul8&list=PLK3MJsXEYEQJTnhBd-lz6zdrLrk-CLifU&index=2>



VLOG of 31 Frank Lloyd Wright Chicago sites

<https://www.youtube.com/watch?v=MC8dpAiC0dw&list=PLK3MJsXEYEQJTnhBd-lz6zdrLrk-CLifU&index=2>



Lecture on illumination design, both architectural and engineering

<https://www.youtube.com/watch?v=6nfeduOIE2I&list=PLK3MJsXEYEQJTnhBd-lz6zdrLrk-CLifU&index=5&t=10s>



Lecture on robotic sensors and navigation; And our internationally competing robots

http://users.etsou.edu/w/wunderjt/ITALY_2009/TALK_SENSORS_&_NAVIGATION.pdf

RESEARCH & PROFESSIONAL DEVELOPMENT

Patents

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

Books in progress

- [1] on **Frank Lloyd Wright**, including fieldwork in Illinois, Pennsylvania, New York, California, Arizona, Japan, and Italy; And created a related [lecture series](#)
[2] on Machine Intelligence, including comparing my two neural network processor designs

Peer-Reviewed Papers

- [3] 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](#) (Also a Session Chair)
- [4] 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](#)
- [5] 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](#)
- [6] 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.
- [7] 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](#)
- [8] 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](#)
- [9] 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](#) (Also a Session Chair)
- [10] Coleman, D. and Wunderlich, J.T. (2008). **O³: 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](#)
- [11] 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](#) (Also a Session Chair)
- [12] Henderson, S., Shreshtha, S., Wunderlich, J.T. (2004). **A high speed AUV test platform (submitted to classified military conference)**.
- [13] Wunderlich, J.T. (2003). **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](#)
- [14] 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. Molino (Ed.): (pp. 117-122). Genova, Italy: Grafica KC s.n.c Press. [PAPER](#) (Also a Session Chair)
- [15] 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](#) (Also Session Chair for multiple sessions)
- [16] Wunderlich, J.T. (2003). **Defining the limits of machine intelligence**. In *Proceedings of IEEE SoutheastCon, Ocho Rios, Jamaica*, [CD-ROM]. IEEE Press. [PAPER](#) (Also Session Chair for multiple sessions)
- [17] Simone, 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. (Also Session Chair for multiple sessions)
- [18] 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](#)
- [19] 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](#)
- [20] 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.
- [21] 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](#)
- [22] 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](#)
- [23] 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](#)
- [24] 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.
- [25] 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 Telemicroprocessor Technology and Space Telerobotics*, Boston, MA: Vol. (2057). (pp. 187-198). SPIE Press. [PAPER](#)

OTHER WRITTEN WORKS (LAB MANUALS MOSTLY CREATED BY STUDENTS, THEN EDITED BY ME)

- [26] ETOWN: 2020 **Computer Engineering Program Self-Study for ABET Accreditation**
- [27] ETOWN: 2018 **IC's, Circuit Trainer, and Power Supply Manual**
- [28] ETOWN: 2019 **FPGA Board & Xilinx software Manual** (previous versions: 2018b 2018a, 2013, pre-2013)
- [29] ETOWN: 2019 **Phoenix Contact NanoLC Programmable Logic Controller Manual** (previous versions:2018)
- [30] ETOWN: 2019 **Phoenix Contact AXL/AXC PLC Manual** (previous versions: 2018, 2017)
- [31] ETOWN: 2019 **Raspberry Pi and ARM Microcontroller Assembly Language Manual and Labs** (previous version: 2017)
- [32] ETOWN: 2019 **Intel 80251 Microcontroller Assembly Language Manual** (previous versions: 2015, 2014, pre-2013)
- [33] ETOWN: 2019 **Relays Manual**
- [34] ETOWN: 2014 **Computer Engineering Program Self-Study for ABET Accreditation**
- [35] ETOWN: 1999: **HTML Web-Page Design Manual** - Last revised in 2010.
- [36] ETOWN: "Eclarion" professional development newsletter. April, 2002 "Etown Faculty Abroad," Editors: J.Wunderlich and N. Carlson.
- [37] 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.
- [38] IBM: Wunderlich, J.T. (1996). **Branch-prediction verification of S/390 supercomputer processors**, Poughkeepsie, NY.
- [39] UDEL: Wunderlich, J.T. (1996). **Optimal kinematic design of redundant and hyper-redundant manipulators for constrained workspaces**. *Ph.D. Dissertation*, University of Delaware.
- [40] UDEL: Wunderlich, J.T., and Elias, J. (1993). **Design of an artificial dendritic tree VLSI microprocessor**. U.Del. research report, 1993.
- [41] PENNSTATE: 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)
- [42] PENNSTATE: Wunderlich, J.T. and P. Swayne (1990). **A Process Control Simulation Program of a Bottling Plant**.
- [43] PENNSTATE: Wunderlich, J.T. (1990). **Areal-Time Process Control Program in Assembly Language, of a Bottling Plant**.

WORKSHOPS, MEETINGS & SYMPOSIA (in addition to Major Conferences listed above under publications)

1989-present: Periodic IEEE, ASME, and USGBC regional meetings, PA
1999-present Etown: Grant Writing, Book Publishing, Campus Internationalization, Student Ethics, First Year Seminars, Teaching-Load, etc. PA
2015 (18 hours), U.S. Cyber-consequences Unit, Arlington, VA
2015 GreenCon2015, Franklin & Marshal College, PA (Speaker)
2014 American Society of Quality (ASQ), PA (Speaker)
2013 GreenCon2013, Dickinson College, PA
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
2001 Office XP Symposium, Valley Forge, PA
1998 Learning, whose responsibility is it? South Bend, IN
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

Judging, Coaching, & Organizing

2015-present **Organizer and Judge:** [Eight annual Architectural defenses](#), PA – also judged by Professional Architects and Engineers, Senior Faculty and Staff, and a Trustee
2014-present **Organizer and Judge:** [Regional and National Phoenix Contact Nanoline PLC \(Programmable Logic Controller\) design competitions](#), PA
2021 **Judge:** Future Cities Competition PA
2016 **Organizer and Judge:** ECKey Contest (wireless control of door locks) PA – contest also judged by a corporate executive, and a Venture Capital VP
2013-2016 **Organizer:** [Four Sustainability symposiums](#), PA
2014 **Organizer and Judge:** Session Chair: *2nd International Conference on Emerging Trends in Engineering and Technology*, London, **ENGLAND**.
2014 **Organizer and Judge:** Mobile Wellness Truck Designs (over \$5500 in student prizes), PA
2003-2013 **Coach and Judge:** Judo Instructor and Coach, PA (*promoted ~200 students in USJA*)
2012 **Judge:** Central-Pennsylvania United States Green Building Council Green-buildings awards, PA
2000-2011 **Organizer:** [Eleven Robotics & Machine Intelligence symposiums](#), PA
2008 **Session Chair:** *12th World Multi-Conf. on Systemics, Cybernetics and Informatics*, Orlando, FL (*with all NASA Researchers*)
2008 **Coach:** [Intelligent Ground Vehicle Competition](#) of 50+ National and International Grad-student teams, and a couple Undergraduate, Detroit, MI
2006 **Coach:** [Intelligent Ground Vehicle Competition](#) of 50+ National and International Grad-student teams, and a couple Undergraduate, Detroit, MI
2004 **Session Chair:** *ANNIE 2008 Artificial Neural Networks in Engineering*, St. Louis, MO
2004 **Session Chair:** *IMG04 Int'l Conf. on Intelligent Manipulation and Grasping*, Genoa, ITALY
2004 **Coach:** [Intelligent Ground Vehicle Competition](#), of 50+ National and International Grad-student teams, and a couple Undergrad, Detroit, MI; we raised \$100,000 in donations
2003 **Session Chair for multiple sessions:** *IEEE SECon Nat'l Conf.*, Ocho Rios, JAMAICA
2002 **Workshop Co-Organizer:** *Professional and Organizational Development (POD) Annual Conf.*, Atlanta, GA.
1996 **Co-Organizer:** Conference of peer-reviewed S/390 & Power-parallel Supercomputer Designs (US and Germany), IBM Country Club NY
• IBM CEO Canceled Conference for fear of loss of intellectual property

Refereeing & Editing

2012-2016 *The National Agency for the Evaluation of Universities and Research Institutes (ANVUR) – throughout Italy*
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.*

Grants

2020 **\$10,000** in electronics equipment from Phoenix Contact USA
2003-present **>\$75,000** Gifts-in-kind of Computer Engineering and Architectural lab hardware and software, and personal books for student use
2001-present **>\$10,000** to send students to present research in Italy, Japan, Jamaica, Michigan, North Carolina, and Florida
2017 **\$10,400** Summer Research Grant ("SCARP) for combining Programmable Logic Controllers (PLC's), Microcontrollers, and other electronics
2017 **\$50,000+** in electronics equipment from Phoenix Contact USA (advanced PLC's)
2017 **\$80,000** in electronics equipment from Phoenix Contact USA ([News Story](#))
2016 **\$800** raised for student prizes, ECKey Contest (*wireless control of door locks*) – contest judged by a Venture Capital VP
2015 **\$TBD** Primary Investigator for Sierra Leone Pharmaceutical Manufacturing Plant Joint-venture (*Student / Professional Design*)
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** Corporate fund-raising for WunderBot projects
2011 **\$5,000** gift from Phoenix Contact for organizing annual meeting of 160+ international executives
2008 **\$750** Summer Grant for conference travels
2007 Computer Consultant to Communications dept. for CISP Interdisciplinary grant
2003 **\$1033** Summer Grant for workshops and conference travels
2002 *Secondary Investigator for \$100,000 Whitaker and CDC Biomedical Engineering Grant proposals (not funded)*
2001 *Robotics and Machine Intelligence Lab proposal (\$145,000 NSF proposal rewritten for fund-raising by Development)*
2001 **\$3500** of electronics (Digilent 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 for Etown Robotics and Machine Intelligence Lab
2001 **\$4000** of Image Processing Training by SVResearch for Etown students

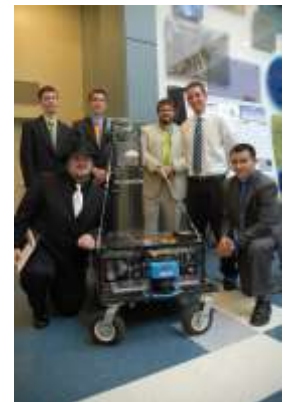
Robotics & Machine Intelligence Lab / Architecture Studio Founder & Director

Organize Engineering, Computing, and Architecture Programs, Competitions, and Symposiums. Over 300 student projects since 1999

http://users.etown.edu/w/wunderjt/home_researchMINE.html



<https://www.etown.edu/schools/school-of-engineering-math-and-computer-science/index.aspx>



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); National Trust for Historic Preservation; Frank Lloyd Wright Trust

Web Creative Content and HTML Site Development

1999-present: [Personal site](#) of educational materials (100's of pages – the largest on campus)

2020: Due to Coronavirus, many lectures recorded and put on [my website](#), [YouTube Channel](#), and "Canvas" educational software

2019: Visited 31 Frank Lloyd Wright sites in Chicago-Land, and made [VIDEO LECTURE](#) for [my Architecture Courses](#)

2017-present [Sample lectures and custom lab manuals page](#) for internal and external assessments, and student enrichment

2013-present: [YouTube Channel](#) with over 100 video lectures and talks

2012-2016: Webmaster for [Engineering & Physics Department](#)

2010-2013: Hosted public and private multi-world [Minecraft servers](#) for college students and children worldwide (via servers at home, and in NYC and Toronto)

2004: Dean of Faculty site

SERVICE & MANAGEMENT

Judging, Coaching, & Organizing

- SEE “RESEARCH” ABOVE

Robotics & Machine Intelligence Lab / Architecture Studio

FOUNDER AND DIRECTOR SINCE 1999

- SEE “RESEARCH” ABOVE

Accreditations

2021 Helped merge ABET-Accredited BS Computer Engineering with ABET-Accredited BS Engineering
2020 Wrote Elizabethtown Computer Engineering self-study for ABET Accreditation
2015 Elizabethtown BS Computer Engineering and BS Engineering re-accredited with no “deficiencies” or “weaknesses.”
2014 Wrote Elizabethtown Computer Engineering self-study for ABET Accreditation
2009 Elizabethtown BS Computer Engineering and BS Engineering accredited with no “deficiencies” or “weaknesses.”
2007 [Proposal](#) to include Elizabethtown College Computer Science in Engineering accreditation
2002 ABET/IEEE Program Evaluator training in Albuquerque NM (at an ASEE conference)
1999 Purdue ABET mock Program Evaluator of Kokomo campus
1998 Purdue ABET Program-Evaluator training

Committees

2017-2023 Facilities, Planning, and Construction Committee (FPCC)

- **With two Presidents, Senior VP’s, and Trustees**
- **Critique presentations by Professional Architects, Engineers, and Developers.**
- **Help decide expenditures up to \$40,000,000 (including P3’s)**
- **Elected by Faculty for three years, then appointed by President**

2020-2022 Architectural Space Planning Committee

2021/22 Computer Scientist Search for traditional & Continuing Ed programs [*N Reddig*]
2018/19 Tenure-Track Computer Scientist Search [*J Wang*]
2017/18 Tenure-Track Computer Scientist Search [*P Li*]
2015/16 Sustainability Strategic-Planning Committee ([REPORT](#))
2015/16 Tenure-Track Computer Scientist Search [*Ting Gu*]
2014/15 Tenure-Track Computer Scientist Search
2014/15 Ware Lecture Steering Committee (**with U.S. Ambassador John Craig**)
2012/13 Sustainability Strategic-Planning Committee ([REPORT](#))
2012 Strategic Planning Committee on Multi-cultural Diversity
2011 Tenure-Track Civil Engineer Search [*B.Read*]
2011 International Committee (with U.S. 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*]
2008 Diversity Committee
2007 Psychology Councilors Search [*L. Harker and K. Sagun*]
2006 Dean of Faculty Search [*C. Bucher*]
2006 Faculty Resource Committee
2002 Dean of Faculty Search, *Committee Secretary* [*M. Pennington*]
2002 Director of Facilities and Construction Search [*J. Metro*]
2002 Tenure-Track Electrical Engineer Search [*I. Grave and T.McBride*]

2001- 04 Chair or Co-Chair, Professional Development Committee:

- **Faculty grant and sabbatical proposals**
- **Introduced faculty peer-mentoring**
- **Led creation of departmental Peer-Review Plans,**
- **Helped lead new faculty orientations**
- **Led authoring of "Eclarion" newsletter**

2000 Tenure-Track Mechanical Engineer Search [*K. DeGoede*]
2000 Student Center [Preliminary Architecture Committee](#)
1998 Purdue Senior Projects Committee
1998 Purdue Microprocessor Committee

1980’s and 90’s Professional Searches for Project Managers and Engineers in A&E (Developers and Consulting Firm) and Hi-Tech (IBM)

1980’s-present: Some involvement with local politics, including one Political Action Committee (PAC), and attending planning commission meetings in PA and CA

Academic Programs Developed

2019-present: **Help change College Brand and strategic position** in Academia, with new Schools, Programs, and facilities including merging Engineering, Computer Science, and Mathematics into new [School of Engineering, Math, and Computer Science](#)
2019 Proposed a Major in Architecture – proposal tabled until after Covid and College restructuring
2017-present Created Individualized Majors in Architecture
2012 Created Architectural Studies Minor
2010 Created Sustainable Design (“*Environmental*”) Engineering option for BS Engineering
2008 Helped develop Computational Branch of Cognitive Science Minor
2003 Helped develop Information Systems Major

MISCELLANEOUS

- 1999-present: Donated most of my professional development funds (\$1000 to \$1400 per year) to student robotics for first five years at Etown (1999-2005), and recently for robotics and architecture. Up to \$2000 per year in personal funds donated.
- 1999-present: Up to **43** Major advisees and **17** Minor advisees per year, plus “Called to Lead” and “Emerging Scholar” mentoring; extra mentoring for international and underrepresented students, including activities on and off campus (host International Thanksgivings, organized lunchtime Basketball)
- 1999-present: Peer-mentoring Faculty and Staff. Many collaborations with Etown Center for Student Success (special needs, etc.).
- 1999-present: Career planning, security clearances, editing résumés.
- 1999-present: Many field trips.
- 1999-2023: [Robotics and Machine Intelligence club/team](#) Advisor
- 2013-2016 [homeschooled Son through Highschool](#)



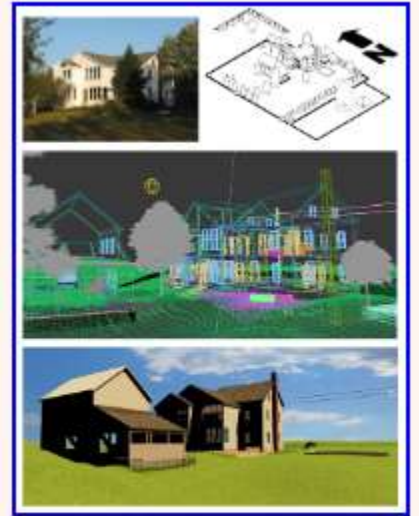
Joseph John's
10th Grade
Portfolio
2013/14



Joseph John's
11th Grade
Portfolio
2014/15



Joseph John's
12th Grade
Portfolio
2015/16



Joseph John's
Freshman
Architecture
2016/17

- 2002-2016: Faculty Mentor for Men's Basketball team
- 2002-2014: [Judo club/course/team](#) Advisor and Coach – promoted 121 students, up to 3rd-degree Brown Belts
- 2005-2008: Volunteered in local elementary schools
- 1986-87: UCSD Rugby Team
- 1982-83 U. Texas Austin Judo Team
- 1980-82: Penn State University-Park Triangle Fraternity (of Engineers, Architects, and Scientists); Pledge-class President, Summer House Manager
- 1980-82: Penn State University-Park Student Senate
- 1980-81 Penn State University-Park Rugby Team