Valparaiso University
COLLEGE OF ENGINEERING

Eric W. Johnson, Ph.D.

Dean, College of Engineering
Professor of Electrical and Computer Engineering
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Education:

1997	Ph.D., Computer Science and Engineering, University of Notre Dame. Dissertation Topic: "*Analysis and Refinement of Iterative Design Processes*"
1994	M.S., Computer Science and Engineering, University of Notre Dame.
1987	B. S., Electrical Engineering, Valparaiso University.

Professional Experience:

2013-Present **Dean**, College of Engineering, Valparaiso University.

2012-2013 **Acting Dean**, College of Engineering, Valparaiso University.

Major Engineering Accomplishments while Dean:

- Created a new strategic plan for the college focused on growth and continued program quality.
- New short-term study abroad opportunities in Germany, China and Haiti.
- Assisted in the development of a new international engineering school with Dalian University in Dalian China.
- Increased enrollment of international and under-represented minority students and the development of engagement and retention plans of each.

2008-2012 **Chair**, Department of Electrical and Computer Engineering, Valparaiso University.

Major Accomplishments:

- Successfully led the effort to achieve ABET accreditation for both degrees in 2010.
- Revised departmental strategic plan.

2011-Present **Professor**, Department of Electrical and Computer Engineering, Valparaiso University.

2003-2011 **Associate Professor**, Department of Electrical and Computer Engineering, Valparaiso University.

1997-2003 **Assistant Professor,** Department of Electrical and Computer Engineering, Valparaiso University.

Primary Responsibilities:

- Implemented and taught courses in both the electrical and computer engineering curriculum. These included courses at all levels from the freshmen to senior year with primary emphasis on computer design.
- Served as academic advisor for electrical and computer engineering students and as faculty advisor for engineering student organizations (Tau Beta Pi).
- Directed the long-term international engineering programs within the college and serve as a resource for students interested in study-abroad opportunities.

Major Accomplishments:

- Developed completely new courses in algorithms and programming, digital system design, advanced logic design with VHDL, VLSI design, systems-on-a-chip, and a discussion course on technology and society.
- Successfully incorporated industry-standard CAD tools for electronic design into the electrical and computer engineering curriculum. This included being one of the first institutions to introduce VHDL into the sophomore year digital design sequence.
- Initiated, developed and implemented the Valparaiso International Engineering Programs (VIEP) in Germany, France and Spain (in cooperation with the Department of Foreign Languages and Literatures). Laid the foundation for a third program in China.
- Organized five faculty workshops on engineering education and promoted faculty endeavors in engineering education research.
- Led the effort to develop the educational software *Time Engineers* that introduces middle and high school students to engineering concepts.
- Organized workshops for over 40 middle and high school science, mathematics and technology teachers that introduced them to engineering topics and careers.

2004-2007 **Director, Reutlingen Overseas Study Center**, Valparaiso University, Reutlingen, Germany.
Primary Responsibilities:

- Developed and implemented the study abroad program for up to 20 students each semester.
- Taught two classes, *German Life and Culture* and *Technology and Society*, to the students each semester.
- Managed an annual operating budget of $140,000 that included supervising four faculty members, organizing student housing and implementing program activities.
- Organized two one-week group trips each semester to Berlin, Germany and Budapest, Hungary along with numerous smaller excursions.

Major Accomplishments:

- Developed an orientation guide for students that outlined program rules and regulations, dorm policies, university and city resources, and travel recommendations.
- Updated the computer resources for the university's student center.
- Taught a distance course (VLSI Design) back to students on the Valparaiso University campus.

1997-2001 **Postdoctoral Research Associate**, Department of Computer Science and Engineering, University of Notre Dame, Notre Dame, IN.
Primary Responsibilities:

- Performed feasibility studies (including the development of simulation environments) to verify a processor-in-memory architecture.
- Supervised five undergraduate students who participated in the research.

1990-1991 **Application Engineer / Head Trainer**, Quickturn Design Systems, Mountain View CA.
Primary Responsibilities:

- Developed new training course material and conducted all employee and customer training.
- Provided pre-sales and post-sales technical support to existing customers, and generated marketing documents.

1988-1990 **Associate Design Engineer**, Unisys Corporation, Eagan, MN.
Primary Responsibilities:

- Assisted in the redesign of a 32-bit parallel I/O card for a mainframe Navy computer including the first pass success of the parallel interface channel ASIC.
- Contributed to all phases of the design process from ASIC design, board development, prototype verification, and on-site test.

1987-1988 **University Instructor,** *Department of Electrical and Computer Engineering, Valparaiso University*.
Primary Responsibilities:

- Developed and taught courses in Pascal Programming to first-year college of engineering students and an electrical engineering survey course to non-majors.

Honors and Awards:

2003 **Valparaiso University Alumni Association Distinguished Teaching Award**
Selected from among all faculty at Valparaiso University.

2003 **Paul and Cleo Brandt Professorship of Engineering**
Selected to hold one of only three chaired professorships in the College of Engineering.

2000-2002 **Frederick Jenny Professorship of Emerging Technology**
Selected to system-on-a-chip technologies.

1995 **Design Automation Conference Scholarship**
Selected as one of five design automation graduate projects from across the country.

1994 **Computer Science and Engineering (CSE) Graduate Assistant Fellow**
Selected as one of two fellows from all CSE graduate students at Notre Dame.

1993 **Computer Science and Engineering (CSE) Outstanding Teaching Assistant**
Selected from all CSE graduate teaching assistants.

1991 **Unisys Outstanding Achievement Award**
Selected for efforts on the UYK-43 project ensuring first-pass success of the PIC ASIC.

Selected Professional Service:

- IEEE Calumet Section Executive Board
  - Served as Student Activities Chair, Secretary, Treasurer, Vice-Chair, Program Chair, Section Chair, Junior Past Chair, Nominations Chair, Senior Past Chair, Audit Chair, and Director. Currently serving as Computer Society Chairman.
- ASEE Illinois/Indiana Section
  - Treasurer (2009-Present)
- Peer reviewer
  - Pedagogical: *ASEE National and Regional Conferences, IEEE Transactions on Engineering Education, International Conference on Microelectronic Systems Education, Online Journal for Global Engineering Education.*
  - Scientific: *Midwest Symposium on Circuits and Systems*

Selected University Service:

- Faculty Senate (2007-2012)
  - Vice Chair (2009-2012)
  - College of Engineering Representative (2007-2009)
  - University Assessment committee and University Council (2007-present)
- International Affairs Committee
  - Chair (2009-2012)
  - College of Engineering Representative (2007-2009)
- College of Engineering Standing Committees:
  - Recruitment Committee (2007-2009)
  - Curriculum (2009-present)
  - Assessment (2009-present)
- University Committees
  - Internationalization Laboratory Task Force – Co-Chair (2010-Present)
  - Master Plan Development Task Force (2010-2012)
  - Working Group on Internationalization and Cross-Cultural Engagement – Co-Chair (2009)
- University Search Committees
  - University Pastor (2010)
  - Provost (2008-2009)
  - Director of International Studies (2008)
  - Career Planning and Placement Center Director (2008)
  - Career Planning and Placement Center Assistant Director (2009)

Professional Affiliations and Honor Societies:

- Institute of Electrical and Electronics Engineers (IEEE) – Senior Member
- American Society for Engineering Education (ASEE)
- Order of the Engineer
- Tau Beta Pi (Honorary Engineering Society)
- Eta Kappa Nu (Honorary Electrical Engineering Society)
- Sigma Xi (Honorary Scientific Research Society)

Refereed Scientific Publications:

1. D. Tougaw, E. Johnson, and D. Egley, "Programmable Logic Implemented Using Quantum-Dot Cellular Automata," *IEEE Trans. on Nanotechnology*, vol. 11, no. 4, 739-745 (2012).
2. M. Budnik and E. Johnson, "Carbon Nanotube Capacitors," *Cutting Edge Nanotechnology*, ed. A.Lazinica, Intech, Vukovar, Croatia, March 2010. pp. 373-390.
3. M. M. Budnik and E.W. Johnson, "A Carbon Nanotube Capacitor," in *Proc. of the 2009 IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Traverse City, MI, June 2-5, 2009.
4. M. M. Budnik, J. D. Wood and E. Johnson, "A Thin, Vertical, Parallel Plate Capacitor with Multi-Wall Carbon Nanotube Electrodes," in *Proc. of the 2008 IEEE Conference on Nanotechnology (NANO)*, Arlington, TX, August 18-21, 2008, pp. 274-276.
5. M. M. Budnik, E. W. Johnson and J. D. Wood, "Electrical Models for Vertical Carbon Nanotube Capacitors," in *Proc. of the 2008 ACM Great Lakes Symposium on VLSI*, Orlando, FL, May 4-6, 2008, pp. 367-370.
6. S. Henderson, E. Johnson, J. Janulis, and D. Tougaw, "Incorporating Standard CMOS Design Process Methodologies into the QCA Logic Design Process," *IEEE Trans. on Nanotechnology*, **3**, 2-9 (2004).
7. J. Janulis, D. Tougaw, S. Henderson and E. Johnson, "Serial Bit Stream Analysis Using Quantum-Dot Cellular Automata," *IEEE Trans. on Nanotechnology*, **3**, 158-164 (2004).
8. E. W. Johnson and J. B. Brockman, "Measurement and Analysis of Sequential Design Processes," *ACM Trans. on Design Automation of Electronic Systems*, vol.3, no. 1, January, 1998, pp. 1-20.
9. J. T. Zawodny, J. B. Brockman, P. M. Kogge and E. W. Johnson, "Cache in Memory: A Lower Power Alternative," in *Proc. of the ISCA Workshop on Power-Driven Microarchitecture*, June, 1998, Barcelona, Spain, 1998, pp. 27-28.
10. B. Wujek, E. W. Johnson, J. E. Renaud, J. B. Brockman, and S.M. Batill, "Design Flow Management and Multidisciplinary Design Optimization in Application to Aircraft Concept Sizing," *Integrated Product and Process Development: Methods, Tools, and Technologies*, John Wiley & Sons, New York, New York, 1998, pp. 355-376.
11. E. W. Johnson and J. B. Brockman, "Towards an Electronic Model for Design Process Refinement," *Computers in Industry*, vol. 30, no. 1, 1996, pp. 27-36.
12. E. W. Johnson J. B. Brockman, and R. Vigeland, "Sensitivity Analysis of Iterative Design Processes," in *Proc. of the International Conference on Computer-Aided Design*, San Jose, CA, November, 1996, pp. 142-145.
13. E. W. Johnson and J. B. Brockman, "Reducing Overall Design Time through Efficient Allocation of Individual Task Times," *AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, Technical Paper AIAA-1996-4159, Bellevue, WA, September, 1996.
14. E. W. Johnson, L. A. Castillo, and J. B. Brockman, "Application of a Markov Model to the Measurement, Simulation, and Diagnosis of an Iterative Design Process," in *Proc. of the 33rd IEEE Design Automation Conference*, Las Vegas, NV, June, 1996, pp. 185-188.
15. B. Wujek, E. W. Johnson, J. E. Renaud, J. B. Brockman and S. M. Batill, "Design Flow Management and Multidisciplinary Design Optimization in Application to Aircraft Concept Sizing," *34th AIAA Aerospace Sciences Meeting*, Technical Paper AIAA-1996-713, Reno, NV, January, 1996.
16. E. W. Johnson and J. B. Brockman, "Incorporating Design Schedule Management into a Flow Management System," in *Proc. of the 32nd IEEE Design Automation Conference*, San Francisco, CA, June, 1995, pp. 82-87.

Refereed Pedagogical Publications:

1. E. Johnson and T. Moore, "Red Light-Green Light: Implementing a Model-Eliciting Activity (MEA) in a Logic Design Course," in *Proc. of the 2010 ASEE/IEEE Frontiers in Education Conference*, Arlington, VA, October, 2010.
2. E. Johnson, D. Tougaw and M. Budnik, "Integrating Entrepreneurship Throughout an Electrical and Computer Engineering Curriculum," in *Proc. of the 2009 ASEE Annual Conference*, Austin, TX, June, 2009.
3. L. Sanders and E. Johnson, "Making a Connection with First-Year Engineering Students," in *Proc. of the 2009 ASEE IL/IN Section Conference*, Valparaiso, IN, March, 2009.
4. E. Johnson, D. Tougaw, K. Leitch, and B. Engerer, "Teaching Probability and Statistics in a First-Year Engineering Course," in *Proc. of the 2008 ASEE/IEEE Frontiers in Education Conference*, Sarasota Springs, NY, October, 2008.

5. E. Johnson, D. Tougaw, K. Leitch and B. Engerer, "A Modular Approach to a First-Semester Engineering Course: Teaching the Fundamentals of Fluid Mechanics." in *Proc. of the 2008 ASEE Annual Conference*, Pittsburgh, PA, June, 2008.
6. E. W. Johnson and S. G. DeMaris, "Developing an International Engineering Experience for Undergraduate Students at a Small University." *Online Journal for Global Engineering Education*, 2(1), 12, 2007, http://digitalcommons.uri.edu/ojgee/vol2/iss1/.
7. E. W. Johnson, S. G. DeMaris and P. D. Tougaw, "Providing an Integrated International Experience for Undergraduate Engineering Students at a Small Institution," in *Proc. of the 2006 ASEE Annual Conference*, Chicago, IL, June, 2006.
8. E. W. Johnson, D. Tougaw, J. D. Will and A. Kraft, "Distance Learning: Teaching a Course from a Remote Site to an On-Campus Classroom," In *Proc. of the 2005 ASEE/IEEE Frontiers in Education Conference*, Indianapolis, IN, October, 2005.
9. P. Tougaw, E. Johnson, S. McMullen and D. Tougaw, "Summer Programs to Improve Science, Mathematics, Engineering, and Technology Education in K-12 Schools," in *Proc. of the ASEE IL/IN Section Conference*, DeKalb, IL, April 2005.
10. J. W. Will and E. W. Johnson, "Scientific Visualization for Undergraduate Education," in *Proc. of the 2004 ASEE Annual Conference*, Salt Lake City, UT, June, 2004.
11. E. W. Johnson, P. D. Tougaw and L. A. Kraft, "Using Computer Technology to Improve Classroom Assessment," in *Proceedings of the 2004 ASEE Illinois/Indiana Section Conference*, East Peoria, IL, March, 2004, pp. 11-13.
12. E. W. Johnson, "Extensive Introduction to VHDL and PLDs in the Sophomore Year," In *Proceedings of the 2003 IEEE International Conference on Microelectronics Education*, Anaheim, CA, June, 2003, pp. 23-24.
13. E. W. Johnson, "Soul of an Engineer, Using a Nonfiction Text to Improve Communication Skills and Career Choices," in *Proc. of the 2003 ASEE Illinois/Indiana Section Conference*, Valparaiso, IN, April, 2003, pp. 31-34.
14. E. W. Johnson, "*Time Engineers*: A Multimedia Program for Secondary School Students," in *Proc. of the 2000 ASEE Annual Conference*, St. Louis, MO, June, 2000.
15. E. W. Johnson "Engineering 101: A Workshop for Secondary School Teachers," In *Proc. of the 1999 ASEE IL/IN Section Conference*, DeKalb, IL, April, 1999, pp. 39-42.
16. E. Johnson and D. Tougaw, "An Integrated Computer Architecture Experience," in *Proc. of the 1998 ASEE/IEEE Frontiers in Education Conference*, Tempe, AZ, November, 1998.

Presentations:

1. E. Johnson, D. Tougaw, K. Leitch and B. Engerer, "A Modular Approach to a First-Semester Engineering Course: Teaching the Fundamentals of Fluid Mechanics." The ASEE - Engineering Design Graphics Division 63th Annual Mid-Year Conference, Berkeley, CA, January 2009.
2. S. G. DeMaris and E. W. Johnson, "Klein aber Fein: Educating Engineers Globally at the Small University," 10th Annual Colloquium on International Engineering Education, West Lafayette, IN, November 2007.
3. S. Henderson, E. Johnson, J. Janulis, and D. Tougaw, "Incorporating Standard CMOS Design Process Methodologies into the QCA Logic Design Process," Second International Workshop on Quantum Dots for Quantum Computing and Classical Size Effect Circuits, Notre Dame, IN, August 2003.

Grant Participation:

1. Tougaw, D. (Principal), Trapp, P. (Co-Principal), Hagenberger, M. (Supporting), Johnson, E. (Supporting), Sanders, L. (Supporting), Mainstone, L. (Supporting), Budnik, M. (Supporting), Raman, J., Olejniczak, K. (Supporting), "KEEN Phase II – Integrating Entrepreneurship into the Curriculum", August 2007 - August 2009, $50,000.
2. Verizon Foundation, Verizon Focus Grant, Exploring the Wide World of Engineering though Technology, January 2001 - May 2003, $30,000.
3. Lilly Endowment Inc., Project for Science, Mathematics and Engineering - Engineering Component: Project Director, January 1997 - July 2000, $90,000.