



## **Eric W. Johnson, Ph.D.**

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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:**

- 2003-present **Associate Professor**, Department of Electrical and Computer Engineering, Valparaiso University.
- 1997-2003 **Assistant Professor**, Department of Electrical and Computer Engineering, Valparaiso University.
- Primary Responsibilities:*
- Implement and teach courses in both the electrical and computer engineering curriculum. These include courses at all levels from the freshmen to senior year with primary emphasis on computer design.
  - Serve as academic advisor for twenty electrical and computer engineering students and as faculty advisor for engineering student organizations (IEEE and TBP).
  - Direct 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 first two Valparaiso international engineering programs (VIEP) in Germany and France (in cooperation with the Department of Foreign Languages and Literatures). Laid the foundation for a third program in China.
  - Organized three 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, 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 Outstanding 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
  - Helped organize and implement an annual series of technical presentations for this organization of over 1000 electrical and computer engineers.
  - 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.

- Peer reviewer
  - American Society for Engineering Education (ASEE): *National and Regional Conferences, Transactions on Engineering Education.*
  - Institute of Electrical and Electronics Engineers (IEEE): *Midwest Symposium on Circuits and Systems, International Conference on Microelectronic Systems Education.*

**Selected University Service:**

- Faculty Senate (2007-present)
  - Vice President (2009-2010)
  - One of two senators representing the college of engineering.
  - Serve on the university assessment committee and the University Council
- International Affairs Committee (2007-present)
  - Chair (2009-present)
  - Provide guidance and strategic planning for the university's study abroad programs and international students.
- College of Engineering Recruitment Committee (2007-present)
  - Work to attract high-quality students to the college of engineering by giving presentations at visit days and supporting other recruitment activities outlined by the committee.
- Search Committees
  - 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
- American Society for Engineering Education
- 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. M.M.Budnik, J.D.Wood and E.Johnson, " A Thin, Vertical, Parallel Plate Capacitor with Multi-Wall Carbon Nanotube Electrodes," *In Proceedings of the 2008 IEEE Conference on Nanotechnology (NANO)*, Arlington, TX, August 18-21, 2008, pp. 274-276.
2. M.M.Budnik, E. W. Johnson and J.D.Wood, "Electrical Models for Vertical Carbon Nanotube Capacitors," *In Proceedings of the 2008 ACM Great Lakes Symposium on VLSI*, Orlando, FL, May 4-6, 2008, pp. 367-370.
3. 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).
4. J. Janulis, D. Tougaw, S. Henderson, and E. Johnson, "Serial Bit Stream Analysis Using Quantum-Dot Cellular Automata," *IEEE Transactions on Nanotechnology*, **3**, 158-164 (2004).
5. E. W. Johnson and J. B. Brockman, "Measurement and Analysis of Sequential Design Processes," *ACM Transactions on Design Automation of Electronic Systems*, vol.3 no. 1, January, 1998.
6. J. T. Zawodny, J. B. Brockman, P. M. Kogge and E. W. Johnson, "Cache in Memory: A Lower Power Alternative," *Workshop on Power-Driven Microarchitecture*, held in conjunction with the International Symposium on Computer Architecture, Barcelona, Spain, 1998.
7. B. Wujek, E. W. Johnson, J. E. Renaud, J. B. Brockman, and S.M. Batill, 1997b, "Design Flow Management and Multidisciplinary Design Optimization in Application to Aircraft Concept Sizing", Chapter 13, *Integrated Product and Process Development: Methods, Tools, and Technologies*, ISBN: 0471-15597-7, John Wiley & Sons.
8. E. W. Johnson and J. B. Brockman, "Towards an Electronic Model for Design Process Refinement," *Computers in Industry*, 1996, vol. 30, no. 1, pp. 27-36.
9. E. W. Johnson, J. B. Brockman, and R. Vigeland, "Sensitivity Analysis of Iterative Design Processes," *In Proceedings of the International Conference on Computer-Aided Design*, November 1996.
10. E. W. Johnson and J. B. Brockman, "Reducing Overall Design Time through Efficient Allocation of Individual Task Times" *In Proceedings of the AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, AIAA-1996-4159, Bellevue, WA, September 1996.
11. 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 Proceedings of the 33rd IEEE Design Automation Conference*, 1996, pp. 185-188.
12. 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*, AIAA-1996-713, January 1996.
13. E. W. Johnson and J. B. Brockman, "Incorporating Design Schedule Management into a Flow Management System," *In Proceedings of the 32nd IEEE Design Automation Conference*, 1995, pp. 82-87.

### Refereed Pedagogical Publications:

1. E. Johnson, D. Tougaw, and M. Budnik, "Teaching Entrepreneurship Throughout an Electrical and Computer Engineering Curriculum," *In Proceedings of the American Society for Engineering Education Annual Conference*, Austin, TX, June 2009.
2. L. Sanders and E. Johnson, "Making a Connection with First-Year Engineering Students," *In Proceedings of the 2009 ASEE IL/IN Section Conference*, Valparaiso, IN, March 2009.
3. E. Johnson, D. Tougaw, K. Leitch, and B. Engerer, "Teaching Probability and Statistics in a First-Year Engineering Course." *In Proceedings of the 2008 ASEE/IEEE Frontiers in Education Conference*, Sarasota Springs, NY, October 2008.
4. 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 Proceedings of the 2008 ASEE Annual Conference*, Pittsburgh, PA, June 2008.
5. 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/>.

6. E. W. Johnson, S. G. DeMaris and P. D. Tougaw, "Providing an Integrated International Experience for Undergraduate Engineering Students at a Small Institution," In *Proceedings of the 2006 ASEE Annual Conference*, Chicago, IL, June 2006.
7. 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 *Proceedings of the 35<sup>th</sup> Annual ASEE/IEEE Frontiers in Education Conference*, Indianapolis, IN, October 2005, pp. F1H-1 – F1H-6.
8. P. Tougaw, E. Johnson, S. McMullen, and D. Tougaw, "Summer Programs to Improve Science, Mathematics, Engineering, and Technology Education in K-12 Schools," *Proceedings of the American Society for Engineering Education Illinois/Indiana Conference (2005)*.
9. 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 Sectional Conference*, East Peoria, IL, March 2004, pp. 11-13.
10. 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.
11. E. W. Johnson, "Soul of an Engineer, Using a Nonfiction Text to Improve Communication Skills and Career Choices," In *Proceedings of the 2003 AS EE Illinois/Indiana Sectional Conference*, Valparaiso, IN, April 2003, pp. 31-34.
12. E. W. Johnson, "*Time Engineers*: A Multimedia Program for Secondary School Students," In *Proceedings of the 2000 ASEE Annual Conference*, June 2000.
13. E. W. Johnson "Engineering 101: A Workshop for Secondary School Teachers," In *Proceedings of the 1999 ASEE IL/IN Section Conference*, 1999, pp. 39-42.
14. E. Johnson and D. Tougaw, "An Integrated Computer Architecture Laboratory *Proceedings of the 28<sup>th</sup> Annual 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 63<sup>th</sup> 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," 10<sup>th</sup> Annual Colloquium on International Engineering Education, West Lafayette, IN, November 2007.