

August 10, 2009

James L. Johnson
Curriculum Vitae

Current address:

Professor James L. Johnson
Computer Science Department
CF 467, MS 9165
Western Washington University
516 High Street
Bellingham, Washington 98225

Cyberspace contact:

Electronic mail: James.Johnson@wwu.edu
Web page: <http://faculty.cs.wwu.edu/johnson>

Education

- Ph.D., Mathematics, University of Minnesota, 1973 (thesis in topological dynamics)
- M.S., Electrical Engineering, University of Minnesota, 1967
- Coursework completed for M.S., Physics, University of Minnesota, 1966
- B.S., Electrical Engineering, University of Louisville, 1965

Foreign Languages

- French. Reasonably fluent.
- Russian. Limited reading ability in the 1980s; inactive subsequently

Academic and Related Experience

• **Positions**

- Computer Science Department, Western Washington University, Bellingham, Washington
 - Professor, 1993-present
 - Department Chair, 1984-1988, 1992-1996
 - Associate Professor, 1984-1993
 - Assistant Professor, 1981-1984
- Mathematical Analyst, National Security Agency, September, 2004 to August, 2005; June 15, 2008 to September 15, 2008; June 22, 2009 to July 31, 2009.
- Visiting Fellow, School of Information Sciences, Australian National University, Canberra, Australia, July-September, 1995
- Visiting Associate Professor, Computer Science Dept., University of Minnesota, Minneapolis, Minnesota, 1988-1989
- Assistant Professor, Mathematics Dept., Augsburg College, Minneapolis, Minnesota, 1975-1980
- Instructor, Mathematics Dept., St. Olaf College, Northfield, Minnesota, 1974-1975

• **Computer Science Courses Taught**

- Discrete Mathematics
- Data Structures
- Database Theory
- Transaction Processing
- Automata Theory
- Computability/Complexity Theory
- Numerical Methods
- Algorithm Analysis
- Programming
- Simulation
- Probabilistic computer performance modeling
- Digital logic
- Computer Architecture
- VLSI Design
- Neural Networks
- History of Computing Technology
- Personal Computers
- Computer Ethics

• **Programming Expertise**

- Ada
- Pascal
- C/C++
- Modula-2
- Java
- Smalltalk
- FORTRAN
- COBOL
- PL/I

• **Mathematics Courses Taught**

- Basic Calculus
- Multivariable Calculus
- Sequences and Limits
- Linear Algebra
- Differential Equations
- Combinatorics, Probability, and Statistics

- **Current Studies**
 - Probability Theory
 - Algorithms
- **Western Washington University Masters' theses and projects supervised**
 - Aran Clauson, *Anomaly Detection with Hidden Markov Models*, August, 2007.
 - Shuyin Zhao, *Representing Relational Databases with XML*, December, 2000.
 - Belinda Liu, *DBCELL: A Cell-density-based Clustering Method for Large Spatial Databases*, December, 1999.
 - Michael Wasnick, *Concurrency Control Simulation: Seven Protocols*, June, 1997.
 - Ichen Lee, *Pattern Recognition using Moment Invariants: Experiments with a Graphical Database System*, June, 1997.
 - Ray Montgomery, *Parsing Context-free Grammars with Genetic Algorithms*, July, 1992.
 - Richard Noren, *Concurrent Objects Used to Simulate VLSI Circuits*, April, 1992.
- **Publications**
 - **Books**
 - James L. Johnson. *Database: Models, Languages, Design*, ISBN: 7-5053-9335-9, Publishing House of Electronics Industry, Beijing, 2004. Chinese translation of database text listed below.
 - James L. Johnson. *Probability and Statistics for Computer Science*, ISBN 0-471-32672-0, John Wiley & Sons, Hoboken, NJ, 2003.
 - James L. Johnson. *Bases de datos: Modelos, lenguajes, disenno*, ISBN 970-613-461-1, Oxford University Press (Mexico), 2000. Spanish translation of database text listed below.
 - James L. Johnson. *Database: Models, Languages, Design*, ISBN 0-19-510783-7, Oxford University Press, New York, 1997.
 - **Articles (★ refereed)**
 18. ★ James L. Johnson. *SQL in the Clouds*, IEEE Computing in Science & Engineering, Vol. 11, No. 4, July/August, 2009, pp. 12-28.
 17. ★ James L. Johnson. *Probability and Statistics*, in The Wiley Encyclopedia of Computer Science and Engineering, Vol. 4, pp. 2208-2221, electronic publication: May, 2008, printed publication: January, 2009.
 16. ★ James L. Johnson and George Fernandez. *Re-engineering Relational Normal Forms in an Object-Oriented Framework*, Proceedings of the Fourth International Conference on Object-Oriented Information Systems (OOIS 97), Brisbane, Australia, M. E. Orłowska and R. Zicari (Eds), Springer-Verlag, 1997.
 15. ★ James L. Johnson. *RISC-Inspired Software through State Transitions*, Proceedings of the Third International Symposium on Applied Corporate Computing, Monterrey, Mexico, pp. 123-132, October, 1995.
 14. ★ James L. Johnson. *Retrieval of Two-Dimensional Drawings with Moment Signatures*, Proceedings of The International Conference on Data and Knowledge Systems for Manufacturing and Engineering, Vol. 1, pp. 344-349, Hong Kong, May 3, 1994.
 13. ★ James L. Johnson. *An Evolutionary Algorithm for Syntax Parsing*, Proceedings of the Third Annual Conference on Evolutionary Programming, San Diego, Calif, February, 1994.
 12. ★ James L. Johnson and Martin Osborne. *Simple Object-Oriented Syntax for the SQL User*, Proceedings of the International Symposium on Applied Computing, pp. 146-160, Monterrey, Mexico, October, 1993.
 11. Martin Osborne and James L. Johnson. *An Only Undergraduate Course in Object-Oriented Technology*, SIGCSE Bulletin, Vol. 25, No. 1, pp. 101-106, March, 1993.
 10. ★ James L. Johnson and Fred M. Ives. *First Silicon*, Proceedings of the 1991 Microelectronics Systems Education Conference, pp. 173-182, San Jose, Calif., July, 1991.
 9. James L. Johnson. *Computing Logical Satisfiability with Neural Networks*, Northcon Conference Record, pp. 234-244, Seattle, Washington, October, 1990.
 8. ★ James L. Johnson. *A Neural Network Approach to the 3-satisfiability Problem*, Journal of Parallel and Distributed Computing, Vol. 6, April, 1989.
 7. James L. Johnson. *Language Parsing with Neural Networks*, Research Report UMSI 89/30

- of The University of Minnesota Supercomputer Institute, Feb., 1989.
6. James L. Johnson. *Parsing with Boltzmann Processes*, Research Report UMSI-89/48, University of Minnesota Supercomputer Institute, April, 1989.
 5. ★ James L. Johnson. *Anatomy of an Educational Network Database*, Software Practice & Experience, Vol. 14, No. 8, Aug., 1984.
 4. James L. Johnson. *Design and Operation of the Minnesota Vocational Education Database*, Educational Management Services, Inc., May, 1981.
 3. James L. Johnson. *Design and Operation of the 8080 Cross-Assembler*, Internal report, Honeywell, Inc., 1976.
 2. James L. Johnson. *Design and Operation of the 8008 Cross-Assembler*, Internal report, Honeywell, Inc., 1975.
 1. James L. Johnson. *An optimal Feature Selection Process for Pattern Recognition Algorithms*, Internal report, Honeywell, Inc., 1974.
- **Presentations (★ invited)**
 10. ★ James L. Johnson. *SQL Evaluation Algorithms for Cloud Computing*, Center for Computing Studies, Institute of Defense Analysis, Bowie, Maryland, August, 2008.
 11. ★ James L. Johnson. *An Introduction to DeFinetti Measures*, Statistical Presentation Series, National Security Agency, Fort Meade, Maryland, August, 2008.
 12. James L. Johnson. *The Importance of Rare Events in Kelly's Algorithm*, Computational Finance Session, SIAM Conference on Scientific Computing, San Mateo, CA, February 19-23, 2007.
 11. ★ James L. Johnson. *A Century's Perspective on the Computability Problem*, Computer Science Department, Loyola University, Baltimore, Maryland, April, 2005.
 10. James L. Johnson. *Perspectives and Speculations on the Evolution of Database Systems*, Congreso Database Marketing: Esencia del CRM, Mexico City, August, 2001.
 9. James L. Johnson. *RISC-Inspired Software through State Transitions* Third International Symposium on Applied Corporate Computing, Monterrey, Mexico, October, 1995.
 8. James L. Johnson. *Automatic Code Generation from Source Matter Templates*, Computing Sciences Laboratory of the Research School of Information Sciences and Engineering, Australian National University, Canberra, Australia; August 2, 1995. Repeated for the Computer Science Department of the Royal Melbourne Institute of Technology, Melbourne, Australia; August 10, 1995.
 7. James L. Johnson. *Retrieval of Two-Dimensional Drawings with Moment Signatures*, 1994 International Conference on Data and Knowledge Systems for Manufacturing and Engineering (DKSME 94), Hong Kong, May, 1994.
 6. James L. Johnson. *An Evolutionary Algorithm for Syntax Parsing*, Third Annual Conference on Evolutionary Programming (EP94), San Diego, California, February 24-26.
 5. James L. Johnson. *Simple Object-Oriented Syntax for the SQL User*, International Symposium on Applied Computing: Research and Applications in Data Bases, Software Engineering, and Distributed Systems, Monterrey, N.L. Mexico, Oct. 13-16, 1993.
 4. Martin Osborne and James L. Johnson. *Teaching Object-Oriented Technology*, Workshop at the 1993 SIGCSE Conference on February 20, 1993 in Indianapolis, Indiana.
 3. James L. Johnson and Ray Montgomery. *Language Parsing with Genetic Algorithms*, Microsoft Natural Language Research Group, Microsoft, Inc., Bellevue, WA., May 26, 1992.
 2. James L. Johnson. *First Silicon*, 1991 Microelectronics Systems Education Conference, San Jose, CA., July, 1991.
 1. James L. Johnson. *Computing Logical Satisfiability with Neural Networks* Northcon, Seattle, WA., October, 1990.
 - **Papers and Books Reviewed**
 14. Jan., 2009: *An HPC Forecast: Partly Cloudy*, by Thomas Sterling and Dylan Stark, for IEEE Computing in Science & Engineering.
 13. Dec., 2008: *Graph Twiddling in a MapReduce World*, by Jonathan Cohen, for IEEE Computing in Science & Engineering.
 12. Sept., 2003: *Symmetry is Objective*, by Krzysztof Burdzy, for Wiley & Sons, New York.
 11. Mar., 1993: *Distributed Database Systems*, by David Bell and Jane Grimson, for IEEE Computer,

- July, 1993.
10. Apr., 1992: *Applying Neural Networks to Find the Minimum Cost Coverage of a Boolean Function*, by P. P. Chu, for IEEE Transactions on CAD.
 9. Sept., 1990: *Neural and Concurrent Real-Time Systems*, by B. Soucek, Wiley, 1989, for IEEE Computer, Vol. 23, No. 9.
 8. Nov., 1986: *Formal Verification of Properties of Concurrent Programs Using Theorem Proving Techniques* for NCC '87.
 7. Sept., 1986: *Writing Application Programs Using Relational Database Languages*, for Software Practice & Experience.
 6. July, 1985: *Implementation of a Database Recovery Manager*, for Software Practice & Experience.
 5. Dec., 1984: *Database Performance Optimization*, for The National Computer Conference (NCC '85).
 4. Aug., 1984: *Algorithms for the BD Tree Structure*, for Software Practice & Experience.
 3. Apr., 1984: *Zeus: An Object-Oriented Operating System for Reliable Applications*, for ACM '84.
 2. Mar., 1984: *The Fifth Generation Grail: A Survey of Related Research*, for ACM '84.
 1. Mar., 1983: *Design of Computer Files* by Owen Hanson, Computer Science Press, 1982, for Journal of Computer-Based Instruction.

- **Software Projects**

- Implementation of a neural network associative memory on the Intel Hypercube parallel computer system (September, 1989).
- Supercomputer simulators in connection with the above-cited paper on parsing with connectionist architectures (January-March, 1989).
- Design of a dataflow compiler to reduce a non-procedural dataflow language to Ada (May, 1985).
- Design and implementation of a communications interface between IBM XT's and VAX 11/780 or IBM 4341 (January, 1984, updated to use IBM AT in September, 1985).
- Design and implementation of a network database system, including all features of the CODASYL model, for use in an educational setting (December, 1982).

Industrial Experience

- Mathematical Analyst, National Security Agency, September, 2004 to August, 2005; June 15, 2008 to September 15, 2008; June 22, 2009 to July 31, 2009.

Consulting Projects

- 1993, National Computer Systems, Inc. Software development seminars on object-oriented design and database interfacing.
- 1992, National Computer Systems, Inc. Review of the database and GUI components of a microcomputer-based school administrative product.
- 1990, Catalog Card Co. Critical review of data processing operations; assessment of hardware and software status in the context of a potential sale to an external party.
- 1989, Zimmer and Associates, Inc. Design of spreadsheet and database macros to facilitate statistical analysis of data correlating educational accomplishment and subsequent employment status.
- 1988, Maxwell Publishing Co. Design and implementation of a system for the automatic generation of common misspellings of English words to be used in the publication of an English Misspelling Dictionary.
- 1984, Minnesota State Department of Education. Design of database interface and report generator to implement federal reporting requirements for Minnesota Vocational Education effort.
- 1980, Minnesota State Department of Education. Design and implementation of a database to facilitate information management and statistical analyses associated with the Vocational Education effort in Minnesota.
- 1977, Minnesota State Department of Education. Statistical analysis of teacher, course, and student data to evaluate the equality of the secondary education in Minnesota.
- 1976, Minnesota State Legislature. Interactive simulator to study the financial consequences of variations in educational funding formulae.