

Ian Parberry

Curriculum Vitae

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Education

Ph.D. (Computer Science) 1984, Univ. of Warwick (England).
B.Sc. (First Class Hons. in C.S. and Math.) 1981, Univ. of Queensland (Australia).
B.Sc. 1980, Univ. of Queensland (Australia).

Academic Employment

1. Univ. of North Texas, Dept. of Computer Science & Engineering (until 2002 known as the Dept. of Computer Sciences). Interim Chair, 2009–2011. Full Professor, since 1995. Associate Professor, 1990–1995. Tenured 1991. Director, Center for Research in Parallel and Distributed Computing, 1990–1995. Director, The Laboratory for Recreational Computing (LARC), since 1993.
2. The Pennsylvania State Univ., Dept. of Computer Science. Assistant Professor, 1984–1990.

Research Interests

Video game programming, procedural content generation, entertainment computing.

Scholarships, Honors, and Awards

1. *The Princeton Review* and *GamePro Magazine* evaluated UNT LARC in the top 50 out of 500 game design programs in North America, 2010. (*The Princeton Review* is the testing company responsible for the GRE).
2. Microsoft Corporation, Most Valuable Professional, 2004–2009 (awarded annually). “Most Valuable Professionals (MVPs) are recognized, credible, and accessible individuals with expertise in one or more Microsoft products who actively participate in online and offline communities to share their knowledge and expertise”.
3. UNT Honor Professor, 2004. Given by UNT’s Student Government Association for “commitment to teaching excellence, good rapport with students, and scholarly publications”.
4. Finalist, Regents Faculty Lecturer, 2004. “The Regents’ Faculty Lecturer will be a person whose strong scholarly or artistic achievements have brought credit to the University of North Texas and to the honoree’s discipline.”
5. ACM SIGACT Distinguished Service Prize, 1998. “In recognition of his distinguished editorship of *SIGACT News* over the past seven years, his creation of the online version of *SIGACT News* and the SIGACT web pages, and his role in designing the TCS virtual address book and maintaining the TCS genealogy.”
6. Commonwealth Scholarship to the United Kingdom, 1981–1984.

Technical Reports

In this and the following sections, bold face indicates the lead author, italics indicates students.

1. ***D. Amarasinghe*** and I. Parberry, “Towards Fast, Believable Real-time Rendering of Burning Objects in Video Games”, Technical Report LARC-2010-04, Laboratory for Recreational Computing, Dept. of Computer Science & Engineering, University of North Texas, October 2010.
2. ***J. Taylor*** and I. Parberry, “Computerized Clutter: How to Make a Virtual Room Look Lived-in”, Technical Report LARC-2010-01, Laboratory for Recreational Computing, Dept. of Computer Science & Engineering, University of North Texas, April 2010. Submitted to a refereed journal in August 2010.
3. ***J. Doran*** and I. Parberry, “Towards Procedural Quest Generation: A Structural Analysis of RPG Quests”, Technical Report LARC-2010-02, Laboratory for Recreational Computing, Dept. of Computer Science & Engineering, University of North Texas, May 2010. Submitted to a refereed journal in March 2010.
4. ***J. Doran*** and I. Parberry, “Emergent Economies for Role Playing Games”, Technical Report LARC-2010-03, Laboratory for Recreational Computing, Dept. of Computer Science & Engineering, University of North Texas, June 2010. Submitted to a refereed journal in June 2010.
5. ***M. Sheeran*** and I. Parberry, “A New Approach to the Design of Optimal Parallel Prefix Circuits”, Technical Report No. 2006:1, Dept. of Computer Science and Engineering, Chalmers University of Technology, Göteborg, Sweden, February 2006.

Research Articles in Refereed Journals

1. ***I. Parberry***, M. Kazemzadeh, T. Roden, *J. R. Nunn*, *J. Scheinberg*, *E. Carson*, *J. Cole*, “Challenges and Opportunities in the Design of Game Programming Classes for a Traditional Computer Science Curriculum”, To Appear in *Journal of Game Design and Development Education*.
2. ***J. Doran*** and I. Parberry, “Controlled Procedural Terrain Generation Using Software Agents”, *IEEE Transactions on Computational Intelligence and AI in Games*, Vol. 2, No. 2, June 2010.
3. ***G. E. Jan***, K. Y. Chang, and I. Parberry, “Optimal Path Planning for Mobile Robot Navigation”, *IEEE Trans. on Mechatronics*, Vol. 13, No. 4, pp. 451–460, 2008.
4. ***K. Y. Chang***, G. E. Jan, C.-M. Su, and I. Parberry, “Optimal Interceptions on Two-Dimensional Grids with Obstacles”, *Journal of Navigation*, Vol. 61, No. 1, pp. 31–43 Jan. 2008.
5. ***T. Roden***, I. Parberry, and *D. Ducrest*, “Toward Mobile Entertainment: A Paradigm for Narrative-Based Audio Only Games”, *Science of Computer Programming*, Vol. 67, Issue 1, pp. 76–90, June 2007.
6. ***T. Roden*** and I. Parberry, “Portholes and Planes: Faster Dynamic Evaluation of Potentially Visible Sets”, *ACM Computers in Entertainment*, Vol. 3, No. 2, April/June 2005.
7. ***G. E. Jan***, K. Y. Chang, S. Gao, and I. Parberry, “A New 4-Geometry Maze Routing Algorithm”, *ACM Transactions on Design Automation of Electronic Systems*, Vol. 9, No. 1, Jan. 2005.

8. **K. Y. Chang**, G. E. Jan, and I. Parberry, “A Method for Searching Optimal Routes with Collision Avoidance on Raster Charts”, *Journal of Navigation*, Vol. 56, No. 3, pp. 371–384, 2003.
9. *O. Kyek*, I. Parberry, and **I. Wegener**, “Bounds on the Number of Knight’s Tours”, *Discrete Applied Mathematics*, Vol. 74, pp. 171–181, 1997.
10. I. Parberry, “An Efficient Algorithm for the Knight’s Tour Problem”, *Discrete Applied Mathematics*, Vol. 73, pp. 251–260, 1997.
11. I. Parberry, “Scalability of a Neural Network for the Knight’s Tour Problem”, *Neurocomputing* Vol. 12, pp. 19–34, 1996.
12. I. Parberry, “A Real-Time Algorithm for the $(n^2 - 1)$ -Puzzle”, *Information Processing Letters*, Vol. 56, pp. 23–28, 1995.
13. I. Parberry, “Load Sharing with Parallel Priority Queues”. *Journal of Computer and System Sciences*, Vol. 50, No. 1, pp. 64–73, 1995.
14. **Z. Obradović** and I. Parberry, “Learning with Discrete Multi-valued Neurons”, *Journal of Computer and System Sciences*, Vol. 49, No. 2, pp. 379–390, 1994.
15. **J. Sorenson** and I. Parberry, “Two Fast Parallel Prime Number Sieves” *Information and Computation*, Vol. 114, No. 1, pp. 115–130, 1994.
16. **P. Y. Yan** and I. Parberry, “Exponential Size Lower Bounds for Some Depth Three Circuits”, *Information and Computation*, Vol. 112, No. 1, pp. 117–130, 1994.
17. I. Parberry, “The Pairwise Sorting Network”. *Parallel Processing Letters*, Vol. 2, No. 2,3, pp. 205–211, 1992.
18. **Z. Obradović** and I. Parberry, “Computing with Discrete Multi-valued Neurons”, *Journal of Computer and System Sciences*, Vol. 45, No. 3, pp. 471–492, 1992.
19. P. Berman, **I. Parberry**, and G. Schnitger, “A Note on the Complexity of Reliability in Neural Networks”, *IEEE Transactions on Neural Networks*, Vol. 3, No. 6, pp. 998–1002, 1992.
20. I. Parberry, “A Computer Assisted Optimal Depth Lower Bound for Nine-Input Sorting Networks”. *Mathematical Systems Theory*, Vol. 24, pp. 101–116, 1991.
21. **P. Y. Yan** and I. Parberry, “Improved Upper and Lower Time Bounds for Parallel Random Access Machines Without Simultaneous Writes”, *SIAM Journal on Computing*, Vol. 20, No. 1, pp. 88–99, 1991.
22. I. Parberry, “Single-Exception Sorting Networks and the Computational Complexity of Optimal Sorting Network Verification”. *Mathematical Systems Theory*, Vol. 23, pp. 81–93, 1990.
23. I. Parberry, “An Optimal Time Bound for Oblivious Routing”. *Algorithmica*, Vol. 5, No. 2, pp. 243–251, 1990.
24. **B. Parker** and I. Parberry, “Constructing Sorting Networks from k -sorters”, *Information Processing Letters*, Vol. 33, No. 3, pp. 157–162, 1989.
25. I. Parberry, “A Note on Nondeterminism in Small, Fast Parallel Computers”. *IEEE Transactions on Computers*, Vol. 38, No. 5, pp. 766–767, 1989.
26. **I. Parberry** and G. Schnitger, “Relating Boltzmann Machines to Conventional Models of Computation”, *Neural Networks*, Vol. 2, No. 1, pp. 59–67, 1989.
27. **I. Parberry** and G. Schnitger, “Parallel Computation with Threshold Functions”, *Journal of Computer and System Sciences*, Vol. 36, No. 3, pp. 278–302, 1988.
28. I. Parberry, “On the Time Required to Sum n Semigroup Elements on a Parallel Machine with Simultaneous Writes”. *Theoretical Computer Science*, Vol. 51, Nos. 1,2, pp 239–248, 1987.

29. I. Parberry, “An Improved Simulation of Space and Reversal Bounded Deterministic Turing Machines by Width and Depth Bounded Uniform Circuits”. *Information Processing Letters*, Vol. 24, No. 6, pp. 363–367, 1987.
30. I. Parberry, “Some Practical Simulations of Impractical Parallel Computers”. *Parallel Computing*, Vol. 4, No. 1, pp. 93–101, 1987.
31. I. Parberry, “On Recurrent and Recursive Interconnection Patterns”. *Information Processing Letters*, Vol. 22, No. 6, pp. 285–289, 1986.
32. **L. M. Goldschlager** and *I. Parberry*, “On the Construction of Parallel Computers from Various Bases of Boolean Functions”, *Theoretical Computer Science*, Vol. 43, No. 1, pp. 43–58, 1986.

Articles in Peer Reviewed Conferences, Symposia & Workshops With Proceedings¹

1. *E. Carson*, **I. Parberry**, and B. Jensen, “Algorithm Explorer: Visualizing Algorithms in a 3D Multimedia Environment”, Proceedings of the 38th ACM Technical Symposium on Computer Science Education, pp. 155–159, Covington, KY, March 2007. (Acceptance rate 108/316, 34%)
2. **I. Parberry**, *J.R. Nunn*, *J. Scheinberg*, *E. Carson*, and *J. Cole*, “SAGE: A Simple Academic Game Engine”, Proceedings of the Second Annual Microsoft Academic Days on Game Development in Computer Science Education, pp. 90–94, February 2007. (Acceptance rate 20/71, 28%)
3. *C. Martin* and **I. Parberry**, “Real Time Dynamic Wind Calculation for a Pressure Driven Wind System”, Proceedings of the 2006 ACM SIGGRAPH Video Game Symposium, pp. 151–154, Boston, MA, July 2006. (Acceptance rate 20/102, 20%)
4. **I. Parberry**, M.B. Kazemzadeh, and *T. Roden*, “The Art and Science of Game Programming”, Proceedings of the 37th ACM Technical Symposium on Computer Science Education, pp. 510–514, Houston, TX, Mar. 2006. (Acceptance rate 104/294, 35%)
5. *R. Ayoub*, **A. Chin**, and I. Parberry, “A New Model for a Student Cyber Security Organization”, Proceedings of the 2005 Information Security Curriculum Development Conference, pp. 12–15, Kennesaw, GA, Sept. 2005.
6. **T. Roden** and I. Parberry, “Designing a Narrative-Based Audio Only 3D Game Engine”, Proceedings of the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology, Valencia, Spain, pp. 274–277, June 15–17, 2005.
7. **T. Roden** and I. Parberry, “Clouds and Stars: Efficient Real-Time Procedural Sky Rendering Using 3D Hardware”, Proceedings of the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology, Valencia, Spain, pp. 434–437, June 15–17, 2005.
8. **I. Parberry**, *T. Roden*, and M. B. Kazemzadeh, “Experience With an Industry-Driven Capstone Course on Game Programming”, Proceedings of the 36th ACM Technical Symposium on Computer Science Education, pp. 91–95, St. Louis, MO, Feb. 23–27, 2005. (Acceptance rate 105/326, 32%)
9. **T. Roden** and I. Parberry, “Portholes and Planes: Faster Dynamic Evaluation of Potentially Visible Sets”, Proceedings of The Second Annual International Workshop in Computer Game

¹Many of the papers listed here are preliminary drafts of papers that subsequently appeared in refereed journals.

- Design and Technology, pp. 108–112, Liverpool, England, Nov. 15–16, 2004.
10. **T. Roden** and I. Parberry, “From Artistry to Automation: A Structured Methodology for Procedural Content Creation”, Proceedings of the 3rd International Conference on Entertainment Computing, pp. 151–156, Eindhoven, The Netherlands, Sept. 1-3, 2004.
 11. **G. E. Jan**, K.-Y. Chang, and I. Parberry, “A New Maze Routing Approach for Path Planning of a Mobile Robot”, Proceedings of the IEEE/ASME International Conference on Advanced Mechatronics, pp. 552–557, Kobe, Japan, July 2003.
 12. **G. E. Jan**, K.-Y. Chang, and I. Parberry, “A New Cell Decomposition Approach for Automatic Path-planning for a Mobile Robot”, Proceedings of the 7th International Conference on Automation Technology, May 2003.
 13. **H. L. Tseng** and I. Parberry, “Are Hopfield Networks Faster Than Conventional Computers?”, Proceedings of the 9th Conference on Neural Information Systems — Natural and Synthetic, pp. 239–245, Denver, Colorado, Nov. 1996.
 14. **I. Parberry**, “The Internet and the Aspiring Games Programmer”. Proceedings of DAGS 95, “Electronic Publishing and the Information Superhighway”, James Ford, Fillia Makedon, Samuel Rebelsky (Editors), pp. 155–159, Birkhäuser, Boston, MA, June 1995.
 15. **I. Parberry** and D. S. Johnson, “The SIGACT Theoretical Computer Science Genealogy: Preliminary Report”, Proceedings of DAGS 95, “Electronic Publishing and the Information Superhighway”, James Ford, Fillia Makedon, Samuel Rebelsky (Editors), pp. 197–205, Birkhäuser, Boston, MA, June 1995.
 16. **I. Parberry**, “On the Complexity of Learning with a Small Number of Nodes”. Proceedings of the 1992 International Joint Conference on Neural Networks, Vol. 3, pp. 893–898, June 1992.
 17. **I. Parberry**, “On the Computational Complexity of Optimal Sorting Network Verification”. Proceedings of The Conference on Parallel Architectures and Languages Europe, Springer-Verlag Lecture Notes in Computer Science, Vol. 506, pp. 252–269, June 1991.
 18. **Z. Obradović** and I. Parberry, “Learning with Discrete Multi-valued Neurons”, Proceedings of the Seventh Annual Machine Learning Conference, pp. 392–399, Morgan Kaufmann, 1990.
 19. **Z. Obradović** and I. Parberry, “Analog Neural Networks of Limited Precision I: Computing with Multilinear Threshold Functions”, Advances in Neural Information Processing Systems 2 (Proceedings of the 1989 IEEE Conference on Neural Information Processing Systems), pp. 702–709, Morgan Kaufmann, 1990.
 20. **I. Parberry**, “A Computer Assisted Optimal Depth Lower-bound for Sorting Networks with Nine Inputs”. Proceedings of Supercomputing '89, pp. 152–161, Reno, Nevada, Nov. 1989.
 21. **P. Y. Yan** and **I. Parberry**, “Improved Upper and Lower Time Bounds for Parallel Random Access Machines Without Simultaneous Writes”, Proceedings of the 1989 International Conference on Parallel Processing, Vol. 3, pp. 226–233, St. Charles, IL, Aug. 1989.
 22. **I. Parberry** and G. Schnitger, “Relating Boltzmann Machines to Conventional Models of Computation”, Proceedings of the Second International Symposium on Methodologies for Intelligent Systems, Charlotte, NC, pp. 347–354, North-Holland, Oct. 1987.
 23. **I. Parberry**, “On the Time Required to Sum n Semigroup Elements on a Parallel Machine with Simultaneous Writes”. Proceedings of the Second International Workshop on Parallel Computing and VLSI, Attica, Greece, Springer-Verlag Lecture Notes in Computer Science, Vol. 227, pp. 296–304, July 1986.

24. **I. Parberry** and G. Schnitger, “Parallel Computation with Threshold Functions (Preliminary Version)”, Proceedings of the Structure in Complexity Theory Conference, Berkeley, California, Springer-Verlag Lecture Notes in Computer Science, Vol. 223, pp. 272–290, June 1986.
25. I. Parberry, “Some Practical Simulations of Impractical Parallel Computers”, *VLSI: Algorithms and Architectures*, Proceedings of the International Workshop on Parallel Computing and VLSI, Amalfi, Italy, May 1984, pp. 27–37, (North Holland, 1985).

Articles in Conferences & Workshops Without Proceedings

1. I. Parberry, “Algorithms for Touring Knights”. Workshop on Algorithmic Research in the Midsouthwest, Austin, TX, Nov. 1994.
2. I. Parberry, “Algorithms for Touring Knights”, Invited Poster, Center for Network Neuroscience, 1994 Center Symposium, University of North Texas, March 1994.
3. P. Berman, I. Parberry, and G. Schnitger, “The Complexity of Reliability and Constraint Satisfaction in Neural Networks”, International Neural Network Society First Annual Meeting, Boston, MA, Sept. 1988. Abstract published in *Neural Networks*, Vol. 1, Supplement 1, p. 76, 1988.

Books

1. F. Dunn and I. Parberry, *3D Math Primer for Graphics and Game Development*, Second Edition, A. K. Peters, To Appear in 2011.
2. F. Dunn and I. Parberry, *3D Math Primer for Graphics and Game Development: Theory and Practice in C++*, Wordware Publishing, 2002.
3. I. Parberry, *Introduction to Computer Game Programming with DirectX 8.0*, Wordware Publishing, March 2001.
4. I. Parberry, *Learn Computer Game Programming with DirectX 7.0*, Wordware Publishing, Aug. 2000.
5. I. Parberry, *Problems on Algorithms*, Prentice Hall, Feb. 1995.
6. I. Parberry, *Circuit Complexity and Neural Networks*, MIT Press, Aug. 1994.
7. I. Parberry, *Parallel Complexity Theory*, in series *Research Notes in Theoretical Computer Science*, (R. V. Book, Ed.), Pitman Press, London, 1987.

Theses

1. “A Complexity Theory of Parallel Computation”. Ph.D. Thesis, Dept. of Computer Science, Warwick Univ., May 1984.

Invited Articles in Books

1. I. Parberry, “Knowledge, Understanding, and Computational Complexity”, *Optimality in Biological and Artificial Networks?*, Chapter 8, pp. 125-144, (D.S. Levine, W.R. Elsberry, Eds.), Lawrence Erlbaum Associates, 1997.

2. I. Parberry, "Circuit Complexity and Feedforward Neural Networks", in *Mathematical Perspectives on Neural Networks*, (P. Smolensky, M. Mozer, D. Rumelhart, Eds.), Lawrence Erlbaum Associates, pp. 85–111, 1996.
3. I. Parberry, "Structural Complexity and Neural Networks", in "The Handbook of Brain Theory and Neural Networks", (Michael Arbib, Ed.), pp. 945–948, MIT Press, 1995.
4. I. Parberry, "A Primer on the Complexity Theory of Neural Networks", in *Formal Techniques in Artificial Intelligence: A Sourcebook*, (R. B. Banerji, Ed.), in series *Studies in Computer Science and Artificial Intelligence*, Vol. 6, pp. 217–268, Elsevier, 1990.

Articles in Books

1. T. Roden and I. Parberry, "Procedural Level Generation", *Game Programming Gems 5*, pp. 578–588, Charles River Media, 2005.

Unrefereed Research Publications

1. "Parallel Speedup of Sequential Machines: A Defense of the Parallel Computation Thesis", *SIGACT News*, Vol. 18, No. 1, pp. 54–67, 1986.

Scholarly Articles

1. I. Parberry, "Game Development in Computer Science Education: From Outcast to Mainstream", Guest Editor's Introduction, *Journal of Game Development*, Vol. 2, No. 2, pp. 5–6, Feb. 2007.
2. U. Wolz, T. Barnes, I. Parberry, M. Wick, "Digital Gaming as a Vehicle for Learning", Proceedings of the 2006 ACM Technical Symposium on Computer Science Education, pp. 394–395, Houston, TX, Mar. 1–5, 2006.
3. B. Spillman and I. Parberry, "How to Present a Paper: A Speaker's Guide", American Membrane Society, 2000.
4. Condon, Edelsbrunner, Emerson, Fortnow, Haber, Karp, Leivant, Lipton, Lynch, Parberry, Papadimitriou, Rabin, Rosenberg, Royer, Savage, Selman, Smith, Tardos, and Vitter, "Challenges for Theory of Computing: Report of an NSF-Sponsored Workshop on Research in Theoretical Computer Science", *SIGACT News*, Vol. 30, No. 2, pp. 62–76, 1999.
5. I. Parberry, "Everything You Wanted to Know About the Running Time of Mergesort But Were Afraid to Ask", *SIGACT News*, Vol. 29, No. 2, pp. 50–57, 1998.
6. I. Parberry, "Surfing the Web", *SIGACT News*, Vol. 26, No. 1, pp. 99–101, 1995.
7. I. Parberry, "A Form for Referees in Theoretical Computer Science". *SIGACT News*, Vol. 25, No. 4, pp. 96–107, 1994.
8. I. Parberry, "SIGACT Trying to Get Children Excited About CS", with M. R. Fellows. *Computing Research News*, Vol. 5, No. 1, p. 7, Jan. 1993.
9. I. Parberry, Scholarly Review of Parallel Sorting. *Computing Reviews*, Vol. 30, No. 11, pp. 578–580, Nov. 1989 (Review Number 8909–0816). Reprinted in *SIGACT News*, Vol. 21, No. 1, pp. 14–17, 1990.
10. I. Parberry, "A Guide for New Referees in Theoretical Computer Science". *Information and Computation*, Vol. 112, No. 1, pp. 96–116, 1994. A preliminary draft appeared in *SIGACT*

News, Vol. 20, No. 4, pp. 92–109, 1989, and was reprinted in *Bulletin of the EATCS*, No. 40, pp. 511–530, 1990.

11. I. Parberry, “A Short Errata to ‘Parallel Complexity Theory’ ”. *SIGACT News*, Vol. 20, No. 1, pp. 58–59, 1989.
12. I. Parberry, “How to Present a Paper in Theoretical Computer Science: A Speaker’s Guide for Students”. *SIGACT News*, Vol. 19, No. 2, pp. 42–47, 1988². Reprinted in *Bulletin of the EATCS*, No. 37, pp. 344–349, 1989, and *The Bit Dropper*, Vol. 29, No. 10, pp. 6–11, 1989. Translated into Korean in *SIGTCS News*, Vol. 4, No. 2, pp. 37–50, 1993. Adopted by *Crypto 95* (distributed to all speakers). Adopted by the 1996 South Central Small College Computing Conference.

Research Funding

1. Microsoft Research, “Developing a Game Engine with Incremental Development”, Computer Game Curriculum RFP 2004, \$80,000, 2005–2006.
2. Microsoft Corporation, “Algorithm Explorer”, \$20,000, 2005–2006.
3. Origin Systems, Inc., “Computer Game Development”, Principal Investigator. Jan.–May 1996. \$8,000.
4. Silicon Graphics, IRIS 4D/340 VGX, August 1995. \$45,000.
5. The National Science Foundation Grant Number CCR–9302917, “Computational Complexity Issues in Neural Network Learning and Computation”, 1993–7. Principal Investigator. \$102,617.
6. Air Force Office of Scientific Research Grant Number F49620–93–1–0100. “Scalability in Neural Network Learning and Computation”, 1993–1996. Principal Investigator. \$67,752.
7. Air Force Office of Scientific Research Grant Number AFOSR–89–0168, Defense University Research Instrumentation Program, “Practical Issues in the Complexity of Neural Networks”, 1988–1989. Principal Investigator. \$100,477.
8. The National Science Foundation Grant Number CCR–8801659, “Efficient Sorting Networks”, 1988–1991. Principal Investigator. \$51,536.
9. Air Force Office of Scientific Research Grant Number AFOSR 87–0400, “Complexity Theory of Neural Networks”, 1987–1991. Principal Investigator. \$412,208.
10. The General Electric Company, “Validation and Verification of Parallel Programs”, 1987. Principal Investigator. \$26,000.
11. Research Initiation Grant, Penn State Univ., “Parallel Time Complexity”, 1985–1986. Principal Investigator. \$5,000.

Educational Funding

1. UNT Innovative Projects Program, “Recapturing the Element of Fun in Education: Competitive/Cooperative Learning via Multi-User Real-Time Distributed Multimedia Edutainment Environments”, Principal Investigator (with William R. Pensyl). \$38,237. 1997–8.
2. IBM Southlake, “Computer Game Prototypes for OS/2”, 1995. Principal Investigator. \$30,000.

²Reviewed in the SIG News section of the *Communications of the ACM*, Vol. 32, No. 1, p. 146, 1989.

Membership in Professional Societies

1. International Game Developer's Association (IGDA), Member since 2003.
2. Association for Computing Machinery (ACM). Voting Member since 1984. Student Member 1980–1984.
3. ACM Special Interest Group on Algorithms and Computation Theory (SIGACT). Member since 1980.

Professional Activities

1. Program Committee Member, 5th International Conference on the Foundations of Digital Games, Monterey, CA, 2010.
2. Program Committee Member, Workshop on Procedural Content Generation in Games, Monterey, CA, 2010.
3. Editor, *The Computer Game Education Review*, since 2009. Journal renamed *Journal of Game Design and Development Education* in 2010.
4. Secretary, Society for the Advancement of the Science of Digital Games, since 2009. Member, Board of Directors, Society for the Advancement of the Science of Digital Games, since 2009. (The Society for the Advancement of the Science of Digital Games is the governing body of the Foundations of Digital Games conference series.)
5. Associate Editor, *Entertainment Computing*, Elsevier, since 2009.
6. Editorial Board Member, *IEEE Transactions on Computational Intelligence and AI in Games*, since 2009.
7. Program Committee Member, Fourth International Conference on the Foundations of Digital Games, 2009.
8. Program Committee Member, Third Annual Microsoft Academic Days Conference on Game Development in Computer Science Education (GDCSE), 2008.
9. Steering Committee Member, Third Annual Conference on Game Development in Computer Science Education (GDCSE), 2008.
10. Guest Editor, *Journal of Game Development*, Special Issue on the Microsoft Academic Days Conference on Enhancing Computer Science with Gaming Concepts and Technologies, 2007.
11. International Programme Committee Member, GAMEON ASIA 2007, March 1-3, 2007, Ritsumeikan University, Shiga, Japan.
12. Committee Member, IEEE Distributed Systems Online, Gaming & Simulation Topic Area, IEEE Computer Society, 2006.
13. Steering Committee Member, Texelectronica 2006.
14. Program Committee Chair, Second Annual Microsoft Academic Days Conference on Enhancing Computer Science with Gaming Concepts and Technologies, 2007.
15. Program Committee Member, FuturePlay 2006: The International Academic Conference on the Future of Game Design and Technology, 2006.
16. Program Committee Member, AAI'06 Workshop on Computational Aesthetics: AI Approaches to Beauty and Happiness, 2006.
17. Member (with U. Wolz, T. Barnes, and M. Wick), Panel on “Digital Gaming as a Vehicle for Learning”, 2006 ACM Technical Symposium on Computer Science Education, Houston, TX, Mar. 1-5, 2006.

18. Panel Member, Senior Project Capstone Course Panel Discussion, ACET 2005, Fort Worth, TX, Oct. 2005.
19. Chair, Birds-of-a-feather session on game programming education, Microsoft TechEd 2005, Orlando, FL, June 2005.
20. Panel member, National Science Foundation, 1995, 2001.
21. Annual ACM Symposium on Theory of Computing (STOC), Publicity Chair, 1995–2001.
22. NSF Workshop on Research in Theory of Computing, Invited Participant, Chicago, IL, March 11–12, 1999.
23. SIGACT Information Director, 1999–2002.
24. ACM SIGACT Distinguished Service Award Committee, Member, 1999–2002. Chair, 1999–2000.
25. Computer Science Accreditation Committee. Accreditation team member for site visit, Fall 1996.
26. SIGACT Electronic Publications Board. Member, 1994–2002.
27. DAGS 95, “Electronic Publishing and the Information Superhighway”, Boston, May 21–June 2, 1995. Program Committee Member.
28. Workshop on Algorithmic Research in the Midsouthwest. Local Arrangements Chair and Workshop Chair, Nov. 1993.
29. City Univ. of New York Research Award Program. External Evaluator, 1992.
30. ACM Student Chapter, Univ. of North Texas. Judge for Programming Contest, Fall 1992.
31. Fourth IEEE Symposium on Parallel and Distributed Processing. Session Chair, Dec. 1992.
32. The Schloß Dagstuhl Seminar on Parallel and Distributed Algorithms, Germany, Mar. 1992. Invited Participant.
33. Workshop on Algorithmic Research in the Midsouthwest. Local coordinator for UNT, 1992–1998.
34. *SIGACT News* Editor 1991–2002. ACM Special Interest Group on Algorithms and Computation Theory. (This position also carries a seat on the SIGACT Executive Committee.)
35. Third IEEE Symposium on Parallel and Distributed Processing, Dallas, TX, November 1991. Program Committee Member.
36. The Schloß Dagstuhl Seminar on Parallel and Distributed Algorithms, Germany, Mar. 1991. Invited Participant and Session Chair.
37. Conference on Parallel Architectures and Languages Europe, Veldhoven, The Netherlands, 1991. Program Committee Member and Session Chair.
38. *Information and Computation*. Editor, 1990–1998.
39. *Journal of Computer and System Sciences*. Associate Editor since May 1989.
40. *SIGACT News*. “The Journal Review Column”, 1989–1991.
41. Post Meeting Workshop, IEEE Conference on Neural Information Processing Systems — Natural and Synthetic, Keystone, Colorado, Dec. 1988. Chair of workshop on Complexity Theory of Neural Networks.
42. The National Science Foundation. Reviewer 1987–1992 (14 reviews)
43. Air Force Office of Scientific Research, Reviewer 1988–1989 (2 reviews)

Invited Talks at Conferences and Workshops

1. “Audio Games”, Invited Talk, Games Accessibility Day, 6th Annual Games for Health Conference, Boston, MA, May 2010.

2. “Education and Research in Game Programming at UNT’s Laboratory for Recreational Computing”, Invited Talk, IEEE MetroCon 2009, Arlington, TX, August 2009.
3. I. Parberry, “SAGE: A Simple Academic Game Engine”, Invited Talk, Microsoft Research Asia Theme Workshop, Beijing, China, Mar. 2006.
4. I. Parberry, “SAGE: A Simple Academic Game Engine”, Invited Talk, Microsoft Academic Days Conference on Enhancing Computer Science with Gaming Concepts and Technologies, Cozumel, Mexico, Jan. 2006.
5. I. Parberry, E. Carson, J. Nunn, J. Scheinberg, “The EdGE: Educational Game Engine”, Invited Poster, Microsoft Faculty Summit 2005, Redmond, WA, Aug. 2005.
6. “Experience With an Industry-Driven Capstone Course on Game Programming”, ACET 2005, Fort Worth, TX, Oct. 2005. Birds-of-a-feather session on game programming education, Microsoft TechEd 2005, Orlando, FL, June 2005. Microsoft Faculty Summit 2005, Breakout Session on Game Programming, Redmond, WA, Aug. 2005.
7. “Training Game Programmers at the University of North Texas”, International Game Developer’s Network ’98, Plano, Texas, Oct. 1998.
8. “The Complexity of Stability in Hopfield Networks”, Post Meeting Workshop on “Optimization Problem Solving in Neural Networks”, 1995 Conference on Neural Information Processing Systems — Natural and Synthetic, Vail, Colorado, Dec. 1995.
9. “Algorithms for Touring Knights”. Post Meeting Workshop on “Neural Network Methods for Optimization Problems”, 1993 Conference on Neural Information Processing Systems — Natural and Synthetic, Vail, Colorado, Dec. 1993. DIMACS Workshop on “Parallel Algorithms: From Solving Combinatorial Problems to Solving Grand Challenge Problems”, Rutgers University, Piscataway, New Jersey, Nov. 1993.
10. “Knowledge, Understanding, and Computational Complexity”. Special Session, *How Close are We to Solving the Learning Problem, and How Can We Do Better?*, 1992 International Joint Conference on Neural Networks, Baltimore, MD, June 1992. 24th Annual ACM Symposium on the Theory of Computing, Victoria, Canada, May 1992 (informal talk). Metroplex Institute for Neurodynamics Conference on Optimality in Biological and Artificial Neural Networks, Dallas, TX, Feb. 1992. Workshop on *Complexity Issues in Neural Computation and Learning*, Post Meeting Workshop, IEEE Conference on Neural Information Processing Systems — Natural and Synthetic, Vail, Colorado, Dec. 1991.
11. “The Computational Complexity of Optimal Sorting Network Verification”. The Schloß Dagstuhl Seminar on Parallel and Distributed Algorithms, Germany, Mar. 1992, Dallas IEEE Computer Society Chapter Meeting, Southern Methodist Univ., Jan. 1991. Workshop on Algorithm Research in the Midsouthwest, Dallas, TX, Oct. 1990.
12. “On the Dynamic Range of Synaptic Weights in a Discrete Neuron Model”. Special Session of The American Mathematical Society Meeting on *Mathematical Issues in Biologically Motivated Computing*, The Univ. of South Florida, Tampa, FL, Mar. 1991.
13. “Ragged Heaps, Parallel Priority Queues, and Halving Networks”. Schloß Dagstuhl Seminar on Parallel and Distributed Algorithms, Germany, Mar. 1991.
14. “Some Thoughts on the Role of Theoretical Computer Science in the Undergraduate Curriculum”. The Computer Science Curriculum Workshop, MIT, Jan. 1991.
15. “A Primer on the Complexity Theory of Neural Networks”. Workshop on Complexity Theory of Neural Networks, Post Meeting Workshop, IEEE Conference on Neural Information Processing Systems — Natural and Synthetic, Keystone, Colorado, Dec. 1988.

16. “Computing with Noisy Neurons: An Overview of Classical Techniques”. Workshop on Fault Tolerance, Post Meeting Workshop, IEEE Conference on Neural Information Processing Systems — Natural and Synthetic, Keystone, Colorado, Dec. 1988.

Colloquia

1. “UNT LARC: Research and Education in Game Programming”, National Gaming Day 2010, Willis Library, Univ. of North Texas, Nov. 2010.
2. “Research and Education in Game Development at UNT LARC”, Dept. of Computer Science, University of Houston, Houston, TX, April 2008.
3. “Two Topics in Game Development”, Dept. of Information Technology, Rochester Institute of Technology, Rochester, NY, April 2007.
4. “SAGE: A Simple Academic Game Engine”, Dept. of Computer Science, University of Louisiana at Lafayette, Lafayette, LA, June 2006.
5. “The Art and Science of Game Programming”, Dept. of Computer Science, University of North Carolina at Charlotte, Charlotte, NC, Mar. 2006.
6. “Experience With an Industry-Driven Capstone Course on Game Programming”, Dept. of Computer Science, Purdue Univ., West Lafayette, IN, Jan. 2006. Dept. of Computer Science, Univ. of Arizona, Tucson, AZ, Sept. 2005. College of Information and Mathematical Sciences, Clayton College and State University, Atlanta, GA, April 2005.
7. “The Joy of Math for Game Programmers”, College of Information and Mathematical Sciences, Clayton College and State University, Atlanta, GA, April 2005.
8. “Three Research Topics in Entertainment Computing”, Dept. of Computer Science, Purdue Univ., West Lafayette, IN, Jan. 2006. Dept. of Computer Science, Univ. of Denver, Denver CO, March 2005. Dept. of Computer Science, Univ. of Arizona, Tucson, AZ, Sept. 2005.
9. “Research and Education in Game Programming”, Fort Worth Chapter of the IEEE, Lockheed Martin, Fort Worth, TX, Nov. 2004.
10. “3D Math Boot Camp: Part 4”, Dallas Chapter of the International Game Developer’s Association, Southern Methodist University, Aug. 2004.
11. “3D Math Boot Camp: Part 3”, Dallas Chapter of the International Game Developer’s Association, Southern Methodist University, Mar. 2004.
12. “3D Math Boot Camp: Part 2”, Dallas Chapter of the International Game Developer’s Association, Southern Methodist University, Nov. 2003.
13. “3D Math Boot Camp: Part 1”, Dallas Chapter of the International Game Developer’s Association, Southern Methodist University, Sept. 2003.
14. “Game Programming at the University of North Texas: 2000”, Invited Talk, The Electronic Game Developers Society, University of Texas at Austin, Nov. 2000.
15. “Training Game Programmers at the University of North Texas”, International Game Developer’s Network ’98, Plano, Texas, Oct. 1998.
16. “The Art and Science of the Computer Game”, Dept. of Computer Science, University of Maryland, College Park, MD, Oct. 1999. Dept. of Computer Science, Texas Christian University, Fort Worth, Texas, Nov. 1998. Dept. of Computer Science, Univ. of Utah, Salt Lake City, Utah, Sept. 1998. Dept. of Computer Science, Univ. of Victoria, Victoria, BC, Canada, Nov. 1997. Distinguished Lecture Series, Dept. of Computer Science, Univ. of Alberta, Alberta, Canada, Sept. 1997. Invited Speaker, Shell Symposium Series in Computer Science, Univ. of Texas at El Paso, Sept. 1997.

17. "The Laboratory for Recreational Computing", Dept. of Computer Sciences, Univ. of North Texas, October 1995.
18. "Algorithms for Touring Knights". Dept. of Mathematics, Université de Lausanne, Switzerland, Apr. 2000. Dept. of Computer Science, University of Maryland, College Park, MD, Oct. 1999. Dept. of Computer Science, Univ. of Alberta, Alberta, Canada, Sept. 1997. Dept. of Electrical Engineering and Computer Science, Univ. of Vermont, Burlington, VT, June 1995. Dept. of Computer Science, Johns Hopkins Univ., Baltimore, MD, June 1994.
19. "Load Sharing with Parallel Priority Queues". Dept. of Computer Science, Univ. of Maryland, College Park, MD, June 1992. Dept. of Computer Science, Johns Hopkins Univ., Baltimore, MD, June 1992. Dept. of Computer Science, Univ. of Delaware, June 1992. Dept. of Computer Science, Univ. of Maryland Baltimore County, Baltimore, MD, June 1992.
20. "Knowledge, Understanding, and Computational Complexity". Dept. of Computer Science, University of Victoria (Canada), April 1993. Dept. of Computer Science, Univ. of Maryland, College Park, MD, June 1992. Air Force Office of Scientific Research, Bolling, DC, June 1992. Dept. of Computer Science, Univ. of Delaware, June 1992. NEC Research Center, Princeton, NJ, June 1992. Neural Network Research Group, Texas Instruments, Dallas, TX, Dec. 1991. Metroplex Institute for Neurodynamics, Dallas, TX, Oct. 1991. ACM Student Chapter, Dept. of Computer Sciences, Univ. of North Texas, Nov. 1991.
21. "Ragged Heaps, Parallel Priority Queues, and Halving Networks". Dept. of Computer Science, Warwick Univ., Mar. 1991. Programming Research Group, Oxford Univ., Mar. 1991.
22. "The Computational Complexity of Optimal Sorting Network Verification". Univ. of Tennessee Space Center, Apr. 1990. Dept. of Computer Science, Univ. of North Texas, Apr. 1990.
23. "Limited Precision Analog Neural Networks". Dept. of Computer and Information Science, Univ. of Delaware, Dec. 1989. Applied Research Laboratory, Penn State Univ., Sept. 1989.
24. "The Complexity of Reliability in Neural Networks". Dept. of Computer Science, Univ. of Queensland, Dec. 1988.
25. "Boltzmann Machines and Unbounded Fan-in Threshold Circuits". Dept. of Computer Science, Duke Univ., Feb. 1987.
26. "Parallel Computation with Threshold Functions". Dept. of Computer Science, Edinburgh Univ., June 1986. Dept. of Computer Science, Warwick Univ., June 1986. Dept. of Computer Science, Liverpool Univ., June 1986.
27. "Parallel Speedup of Sequential Machines". Coordinated Science Laboratory, Univ. of Illinois at Urbana-Champaign, Dec. 1984. IBM Research, San Jose, Aug. 1984. Dept. of Computer Science, Univ. of Queensland, Aug. 1984. Center for Research in Computing Technology, Harvard Univ., May 1984. Dept. of Computer Science, Yale Univ., May 1984. Dept. of Electrical Engineering and Computer Science, Princeton Univ., May 1984. Dept. of Computer Science, Penn State Univ., May 1984. Dept. of Computer Science, Univ. of Chicago, May 1984. Dept. of Computer and Information Science. Univ. of Pennsylvania, May 1984.
28. "On the Construction of Parallel Computers from Various Bases of Boolean Functions". Dept. of Computer Science, Yale Univ., Jan. 1983.

Teaching Experience

Graduate: Game Programming, Computational Complexity Theory, Algorithms and Data Structures, Parallel Complexity Theory, Neural Network Complexity Theory, Graphics.

Undergraduate: Game Programming, C++ Programming, Social Issues, Analysis of Algorithms, Data Structures, Compilers, Graphics.

Special Instructional Activities

1. Developed undergraduate Certificate in Game Programming, first awarded in 2010.
2. Developed four undergraduate courses on game programming, 1993–present, pioneering the teaching of game programming at the university level.
3. Established UNT LARC (The Laboratory for Recreational Computing), 1993.
4. Co-taught a graduate-level interdisciplinary seminar course, “Current Trends in Biologically Motivated Computing”, with David Tam (Dept. of Biology) and Jacek Kowalski (Dept. of Physics), Spring 1993.
5. Developed a graduate level course on the computational complexity of neural networks. Dept. of Computer Science, Penn State Univ., Spring 1988 (with P. Berman). Also taught at the Dept. of Computer Sciences, Univ. of North Texas, Fall 1990, 1991, 1992.
6. Developed a regular graduate level course in parallel complexity theory, Dept. of Computer Science, Penn State Univ., 1986. Taught Spring 1986, Spring 1987, Spring 1988, Fall 1988, Fall 1989. A Course Outline for 1987 appears in *SIGACT News*, Vol. 19, No. 2, p. 41, 1988.

Doctoral Students

Current Doctoral Students: Jon Doran, Dhanyu Amarasinghe, Josh Taylor, Timothy McMahon, Vincent Liguori.

1. Timothy Roden, “Procedural Content Creation and Technologies for 3D Graphics Applications and Games”, Ph. D. Thesis, Dept. of Computer Science and Engineering, Univ. of North Texas, May 2005. (Currently an Assistant Professor at Univ. of Louisiana at Lafayette).
2. Hung-Li Tseng, “Computational Complexity of Hopfield Networks” Ph. D. Thesis, Dept. of Computer Sciences, Univ. of North Texas, Aug. 1998. (Currently an Assistant Professor at Chaoyang Univ. of Technology, Taiwan).
3. Zoran Obradović, “Discrete Multi-Valued Neural Networks”, Ph. D. Thesis, Dept. of Computer Science, Penn State Univ., Feb. 1991. (Currently a Professor at Temple Univ.)
4. Pei Yuan Yan, “Lower Bound Techniques in Some Parallel Models of Computation”. Ph. D. Thesis, Dept. of Mathematics, Penn State Univ., June 1989.
5. Bruce Parker, “PRAM Simulations on Bounded Degree Networks”. Ph. D. Thesis, Dept. of Computer Science, Penn State Univ., Dec. 1988.

Doctoral Thesis Committee Membership

1. Martin Kley, Dept. of Mathematics, Université de Lausanne, Switzerland, 2000 (Expert).
2. Dipshankar Mukherjee, Dept. of Computer Science and Technology, Bengal Engineering College (Deemed University), Howrah, India, 1998 (External Examiner).
3. Hung-Li Tseng, Dept. of Computer Sciences, Univ. of North Texas., 1998 (Advisor).
4. David Mitchell, Dept. of Management Science, Univ. of North Texas, 1998 (University Member).
5. Junsu Yi, Dept. of Business Computing and Information Systems, Univ. of North Texas, 1997 (University Member).

6. George Mobus, Dept. of Computer Sciences, Univ. of North Texas, 1994 (Committee Member).
7. Adonis Simvonis, Dept. of Computer Science, Univ. of Texas at Dallas, 1991 (External Member).
8. Zoran Obradović, Dept. of Computer Science, Penn State Univ., 1991 (Advisor).
9. Pei Yuan Yan, Dept. of Mathematics, Penn State Univ., 1989 (Advisor).
10. Bruce Parker, Dept. of Computer Science, Penn State Univ., 1988 (Advisor).
11. Fernando Ferreira, Dept. of Mathematics, Penn State Univ., 1988 (External Member).
12. Douglas Reeves, Dept. of Computer Science, Penn State Univ., 1986 (Committee Member).

Master's Students

1. Steven P. Dombrowsky, "Intrinsic and Extrinsic Adaptation in a Simulated Combat Environment". M.S. Thesis, Dept. of Computer Science, Univ. of North Texas (Dec. 1994).
2. Paul Callahan, "The Space Complexity of the Planar Circuit Value Problem over Different Bases". Master's Paper, Dept. of Computer Science, Penn State Univ., (Aug. 1989).
3. Pei Yuan Yan, "On Minimum Integer Weights of Threshold Functions". Master's Paper, Dept. of Computer Science, Penn State Univ., June 1989.
4. Mirjana Obradović, "An Environment for Designing and Testing Parallel Algorithms". Master's Paper, Dept. of Computer Science, Penn State Univ., Mar. 1989.
5. Vinayak Bhalerao, "Experiments with Bidirectional Associative Memory for Visual Pattern Recognition". Master's Paper, Dept. of Computer Science, Penn State Univ., July 1988.
6. Donald Ginn, "Netspell: A Connectionist Spelling Checker". Master's Paper, Dept. of Computer Science, Penn State Univ., June 1988.
7. Kelly Conway, "A Parallel Language Compiler and Shared Memory Machine Simulation". Master's Paper, Dept. of Computer Science, Penn State Univ., July 1986.

Master's Thesis Committee Membership

1. Lonny McMichael, Dept. of Computer Science, Univ. of North Texas, Aug. 1992 (Committee Member).
2. Ajita John, Dept. of Computer Science, Univ. of North Texas, July 1992 (Committee Member).

Selected Committee Membership and Service

1. Promotion and Tenure Committee, Dept. of Materials Science & Engineering, 2007–8.
2. Promotion and Tenure Committee, Dept. of Engineering Technology, 2007–8 (Chair).
3. Faculty Senate, Member, 2003–2005.
4. Faculty Senate Faculty Salary Study Committee, Member, 2004–2005.
5. Faculty Senate Charter/Bylaws Committee, Member, 2004–2005.
6. Provost's Increasing Research Task Force, Member, 2004–2005.
7. Search Committee, Dean of School of Library and Information Science, 1995–6.
8. Faculty Hiring Committee, Dept. of Computer Sciences, 1995–6.
9. Chair Search Committee, Dept. of Computer Sciences, 1995–6, 1999–2001. (Chair, Fall 2000).
10. College of Arts and Sciences Graduate Committee. Member, 1995–8, 2001–2003.

11. College of Arts and Sciences Committee on the Future of Science. Member, 1994.
12. Information Resources Council Subcommittee on Research, University of North Texas. Member 1993–6.
13. Undergraduate Committee, Dept. of Computer Sciences, Univ. of North Texas. Member, 1993–4, 1995–8.
14. Graduate Committee, Dept. of Computer Sciences, Univ. of North Texas. Member, 1998–2001.
15. Faculty Senate Computer Advisory Committee. Member, 1992–3.
16. Personnel Affairs Committee, Dept. of Computer Sciences, Member, 1991–7, 1998–2003, 2004– (Chair 1991–3, 1998–9, 2007–9).
17. Executive Committee, Dept. of Computer Sciences, Univ. of North Texas. Member, 1991–7, 2004–2006.