

TIMOTHY WILLIAM O'NEIL

PRIMARY RESEARCH INTERESTS

Loop transformation and scheduling, parallel processing, number theory, math history, math and computer science education.

EDUCATION

Ph.D., Computer Science and Engineering, THE UNIVERSITY OF NOTRE DAME, May 2002.

- THESIS: *Techniques for Optimizing Loop Scheduling*
- ADVISORS: Edwin H.-M. Sha, Peter M. Kogge.

M.S., Computer and Information Sciences, THE OHIO STATE UNIVERSITY, June 1993.

M.S., Mathematics, THE OHIO STATE UNIVERSITY, August 1991.

B.S., Computer Science, CLARION UNIVERSITY OF PENNSYLVANIA, May 1989.

B.S.Ed., Secondary Education Mathematics, CLARION UNIVERSITY OF PENNSYLVANIA, May 1989.

- Graduated *cum laude*.
- Pennsylvania secondary school (grades 7-12) math certification, June 1989.

ADDITIONAL EDUCATION:

- Completed all Ph.D.-related coursework in Mathematics, Bowling Green (Ohio) State University, 1993-96.

EMPLOYMENT PROFILE

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| 2002 – present | ASST./ASSOC. PROFESSOR, Department of Computer Science.
THE UNIVERSITY OF AKRON, Akron OH. <ul style="list-style-type: none">▪ Assistant Prof., 2002-2007; Associate Prof., 2007-present.▪ Principle instructor for two classes per semester. |
| 2001 – 2002 | GRAD. FELLOW/RESEARCH ASSOC., Dept. of C.S. and Engineering.
THE UNIVERSITY OF NOTRE DAME, Notre Dame IN. <ul style="list-style-type: none">▪ Graduate Fellow, 2001-2002.<ul style="list-style-type: none">○ Principle instructor for CSE 210, Spring Semester 2002.▪ Research Associate, Summer 2002.<ul style="list-style-type: none">○ Assisted Prof. Mathias Scheutz with curriculum development. |
| 2000 – 2001 | SENIOR LECTURER, Department of Computer Science.
THE UNIVERSITY OF TEXAS AT DALLAS, Richardson TX. <ul style="list-style-type: none">▪ Principle instructor for two classes per semester. |
| 1998 – 2000 | GRADUATE FELLOW, Department of Computer Science and Engineering.
THE UNIVERSITY OF NOTRE DAME, Notre Dame IN. <ul style="list-style-type: none">▪ Research assistant to Prof. Edwin Sha, 1998-2000.▪ Teaching assistant for CSE 341, Spring Semester 2000. |

- 1996 – 1998 INSTRUCTOR, Department of Mathematics and Computer Science.
MANCHESTER COLLEGE, North Manchester IN.
- Taught 3-5 classes per semester plus intensive January session.
- 1993 – 1996 GRADUATE FELLOW, Department of Mathematics and Statistics.
BOWLING GREEN STATE UNIVERSITY, Bowling Green OH.
- Principle instructor for 1-2 classes per semester.
- 1989 – 1993 GRADUATE TEACHING ASSISTANT, Department of Mathematics.
THE OHIO STATE UNIVERSITY, Columbus OH.
- Principle instructor for 1-4 classes per quarter.
- 1988 STUDENT TEACHER, Department of Mathematics.
CLARION AREA JUNIOR-SENIOR HIGH SCHOOL, Clarion PA.
- Taught 7th & 8th Grade Math, Algebra and Trig., Fall Semester 1988.

PROFESSIONAL AFFILIATIONS

- Institute of Electrical and Electronics Engineers, 1999-present.
- International Society for Computers and Their Applications, 1999-2003, 2007.
- Mathematics Association of America, 1993-1996.
- National Council of Teachers of Mathematics, 1987-1990.
- Pennsylvania Council of Teachers of Mathematics, 1987-1989.
- Pennsylvania State Education Association, 1986-1989.

COLLEGE COURSES TAUGHT, COMPUTER SCIENCE

THE UNIVERSITY OF AKRON (2002 – present)

- 3460:209 – Intro. to Comp. Science (2 semesters, Java programming)
- 3460:210 – Data Structures and Algorithms I (1 semester)
- 3460:306 – Assembly Language Programming (1 semester)
- 3460:316 – Data Structures and Algorithms II (1 semester)
- 3460:4/540 – Compiler Design (teaching Spring 2008)
- 3460:4/526 – Operating Systems (8 semesters, teaching Fall 2008)
- 3460:4/577 – Introduction to Parallel Processing (3 semesters)
- 3460:490 – Senior Seminar in Computer Science (2 semesters, teaching Spring 2008)
- 3460:641 – Optimization for Parallel Compilers (2 semesters, teaching Fall 2008)
- 3460:665 – Advanced Computer Architecture (1 semester)
- 3460:677 – Parallel Processing (1 semester)

THE UNIVERSITY OF NOTRE DAME (1998 – 2000, 2001 – 2002)

- CSE 210 – Discrete Mathematics (1 semester)
- CSE 341 – Operating Systems Principles (1 semester, teaching assistant)

THE UNIVERSITY OF TEXAS AT DALLAS (2000 – 2001)

- CS 3305 – Discrete Mathematics for Computing II (3 semesters)
- CS 5333 – Discrete Structures (1 semester)

MANCHESTER COLLEGE (1996 – 1998)

- CPTR 101 – Introduction to Computers (2 semesters)
- CPTR 105 – Computer Programming I (2 semesters, Pascal programming)
- CPTR 217 – C Programming (1 semester)

COLLEGE COURSES TAUGHT, MATHEMATICS

MANCHESTER COLLEGE (1996 – 1998)

- MATH 103 – Survey of Mathematical Thought (1 semester)
- MATH 112 – College Algebra (3 semesters)
- MATH 120 – Precalculus (2 semesters)
- MATH 121 – Calculus I (1 semester)
- MATH 122 – Calculus II (1 semester)
- MATH 130 – Discrete Mathematics (1 semester)
- MATH 233 – Numerical Analysis (1 semester)

BOWLING GREEN STATE UNIVERSITY (1993 – 1996)

- MATH 120 – College Algebra (1 semester)
- MATH 128 – Precalculus Mathematics I (1 semester, team taught)
- MATH 241 – Math for Elementary Teachers I (4 semesters)
- MATH 242 – Math for Elementary Teachers II (1 semester)

THE OHIO STATE UNIVERSITY (1989 – 1993)

- MATH 050 – Precollege Mathematics I (4 quarters)
- MATH 075 – Precollege Mathematics II (5 quarters)
- MATH 104 – Basic College Mathematics (2 quarters)
- MATH 116 – Survey of Finite Mathematics (1 quarter)
- MATH 130 – Mathematical Analysis for Business I (1 quarter)
- MATH 148 – College Algebra (1 quarter)
- MATH 151 – Calculus and Analytic Geometry I (1 quarter, recitation instructor)
- MATH 152 – Calculus and Analytic Geometry II (1 quarter, recitation instructor)
- MATH 153 – Calculus and Analytic Geometry III (1 quarter, recitation instructor)

PUBLICATIONS

PUBLISHED AND ACCEPTED JOURNAL PAPERS

- T.W. O'Neil and E. H.-M. Sha, "Time-Constrained Loop Scheduling with Minimal Resources", *Journal of Embedded Computing*, Vol. 2, October 2006, pp. 103-117.
- T.W. O'Neil and E. H.-M. Sha, "Combining Extended Retiming and Unfolding for Rate-Optimal Graph Transformation", *Journal of VLSI Signal Processing Systems for Signal, Image and Video Technology*, Vol. 39, March 2005, pp. 273-293.
- E. H.-M. Sha, T.W. O'Neil and N.L. Passos, "Efficient Polynomial-Time Nested Loop Fusion with Full Parallelism", *International Journal of Computers and Their Applications*, Vol. 10, March 2003, pp. 9-24.
- Z. Wang, T.W. O'Neil and E. H.-M. Sha, "Optimal Loop Scheduling for Hiding Memory Latency Based On Two Level Partitioning and Prefetching", *IEEE Transactions on Signal Processing*, Vol. 49, November 2001, pp. 2853-2864.
- T.W. O'Neil and E. H.-M. Sha, "Retiming Synchronous Data-Flow Graphs to Minimize Execution Time", *IEEE Transactions on Signal Processing*, Vol. 49, October 2001, pp. 2397-2407.
- Z. Wang, T.W. O'Neil and E. H.-M. Sha, "Minimizing Average Schedule Length Under Memory Constraints by Optimal Partitioning and Prefetching", *Journal of VLSI Signal Processing Systems for Signal, Image and Video Technology*, Vol. 27, January 2001, pp. 215-233.
- S. Tongsimma, T.W. O'Neil, C. Chantrapornchai and E. H.-M. Sha, "Properties and Algorithms for Unfolding of Probabilistic Data-flow Graphs", *Journal of VLSI Signal Processing Systems for*

Signal, Image and Video Technology, Vol. 25, No. 3, July 2000, pp. 215-234.

- F. Chen, T.W. O'Neil and E. H.-M. Sha, "Optimizing Overall Loop Schedules using Prefetching and Partitioning", *IEEE Transactions on Parallel and Distributed Systems*, Vol. 11, No. 6, June 2000, pp. 604-614.
- T.W. O'Neil, "Catalan's Equation", *Mathematics in College*, 1998, pp. 53-58.
- T.W. O'Neil and D. Bhattacharya, Exploring Fermat's Last Theorem, *Ontario Mathematics Gazette*, Vol. 29, September 1990, pp. 18-21.
- T.W. O'Neil and A.M.W. Glass, "Constants for Linear Forms in Three and Four Logarithms", *Ulam Quarterly*, accepted for publication.

SUBMITTED JOURNAL PAPERS

- E.R. Wheland, T.W. O'Neil, J.D. Adler and K.J. Liszka, "The Poster Session: A Tool for Education, Assessment and Recruitment", *Innovations in Education and Teaching International*, submitted for publication.
- T.W. O'Neil, S. Tongsima and E. H.-M. Sha, "Extended Retiming: Transforming Data-Flow Graphs to Minimize Clock Period", *International Journal of Computers and Their Applications*, submitted for publication.

SUBMITTED, PUBLISHED AND ACCEPTED CONFERENCE PAPERS

- M.E. Richter, D.J. Poeschl and T.W. O'Neil, "New Heuristics for Rotation Scheduling", in *Proc. 2008 International Conference on Parallel and Distributed Processing Techniques and Applications*, in conjunction with the *2008 World Congress in Computer Science, Computer Engineering and Applied Computing*, Las Vegas NV, June 2008, submitted for publication.
- S.F. Khasawneh, M.E. Richter and T.W. O'Neil, "Static Scheduling for Synchronous Data-Flow Graphs", in *Proc. ISCA 22nd International Conference on Computers and Their Applications*, Honolulu HI, March 2007, pp. 38-43.
- T.W. O'Neil and E. H.-M. Sha, "Static Scheduling of Split-Node Data-Flow Graphs", in *Proc. IASTED 17th International Conference on Parallel and Distributed Computing and Systems*, Phoenix AZ, November 2005, pp. 125-130.
- T.W. O'Neil and E. H.-M. Sha, "Using Unfolding to Minimize Inter-Iteration Dependencies", in *Proc. IASTED 16th International Conference on Parallel and Distributed Computing and Systems*, Cambridge MA, November 2004, pp. 342-347. (Nominee for best paper.)
- T.W. O'Neil, "Optimal Graph Transformation Assuming Alternate Scheduling Models", in *Proc. ISCA 16th International Conference on Parallel and Distributed Systems*, Reno NV, August 2003, pp. 55-60.
- T.W. O'Neil and E. H.-M. Sha, "Unfolding a Split-Node Data-Flow Graph", in *Proc. IASTED 14th International Conference on Parallel and Distributed Computing and Systems*, Cambridge MA, November 2002, pp. 717-722.
- T.W. O'Neil and E. H.-M. Sha, "Using Retiming to Minimize Inter-Iteration Dependencies", in *Proc. ISCA 16th International Conference on Parallel and Distributed Systems*, Louisville KY, September 2002, pp. 482-487.
- T.W. O'Neil and E. H.-M. Sha, "Minimizing Resources in a Repeating Schedule for a Split-Node Data-Flow Graph", in *Proc. IEEE/ACM 12th Great Lakes Symposium on VLSI*, New York City NY, April 2002, pp. 136-141.
- T.W. O'Neil and E. H.-M. Sha, "On Retiming Synchronous Data-Flow Graphs", in *Proc. ISCA 14th International Conference on Parallel and Distributed Systems*, Richardson TX, August 2001, pp. 103-108.

- T. W. O'Neil, E. H.-M. Sha and S. Tongsima, "Parallelizing Synchronous Data-Flow Graphs via Retiming", *4th International Conference on Algorithms and Architectures*, Hong Kong, December 2000, pp. 252-263.
- T.W. O'Neil and E. H.-M. Sha, "Optimal Graph Transformation using Extended Retiming with Minimal Unfolding", in *Proc. IASTED 12th International Conference on Parallel and Distributed Computing and Systems*, Las Vegas NV, Nov. 2000, Vol. I, pp. 128-133.
- T.W. O'Neil and E. H.-M. Sha, "Minimizing Inter-Iteration Dependencies for Loop Pipelining", in *Proc. ISCA 13th International Conference on Parallel and Distributed Systems*, Las Vegas NV, August 2000, pp. 412-417.
- T.W. O'Neil and E. H.-M. Sha, "Rate-Optimal Graph Transformation via Extended Retiming and Unfolding", in *Proc. IASTED 11th International Conference on Parallel and Distributed Computing and Systems*, Cambridge MA, November 1999, Sec. 10, pp. 764-769.
- T.W. O'Neil, S. Tongsima and E. H.-M. Sha, "Optimal Scheduling of Data-Flow Graphs Using Extended Retiming", in *Proc. ISCA 12th International Conference on Parallel and Distributed Systems*, Fort Lauderdale FL, August 1999, pp. 292-297.
- T.W. O'Neil, S. Tongsima and E. H.-M. Sha, "Extended Retiming: Optimal Scheduling via a Graph-Theoretical Approach", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Phoenix AZ, March 1999, Vol. 4, pp. 2001-2004.
- S. Tongsima, T.W. O'Neil and E. H.-M. Sha, "Unfolding Probabilistic Data-flow Graphs Under Different Timing Models", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing*, Phoenix AZ, March 1999, Vol. 4, pp. 1889-1892.

CONTRIBUTED TO

- C.D. Bennett, J. Blass, A.M.W. Glass, D.B. Meronk and R.P. Steiner, "Linear Forms in the Logarithms of Three Positive Rational Numbers", *J. Th. Num. Bordeaux*, Vol. 9, No. 1, 1997, pp. 97-136.
- "January Calendar", *Mathematics Teacher*, Vol. 84, No. 1, 1991, pp. 36-40.
- "December Calendar", *Mathematics Teacher*, Vol. 83, No. 12, 1990, pp. 725-729.

GRADUATE STUDENTS ADVISED

- Samer F. Khasawneh, M.S.C.S. (Thesis) student, August 2007. Project: *Static Scheduling of Synchronous Data-Flow Graphs*.
- Michael E. Richter, M.S.C.S. (Thesis) student, August 2007. Project: *Variations on Rotation Scheduling*.
- Current advisees
 - Krishna C. Chakilam, M.S.C.S. (Thesis) student, expected graduation December 2008.
 - Ameen H. Mirza (co-advisor with D. Mugler), M.S.C.S. (Thesis) student, expected graduation December 2008.
 - David J. Poeschl, M.S.C.S. (Thesis) student, expected graduation August 2008.
 - Rama K. Pullaguntla, M.S.C.S. (Thesis) student, expected graduation August 2008.

GRANTS

- Hewlett-Packard Technology for Teaching grant (T. Margush P.I.), *Tablet Technology: Supporting Programming and Learning*, \$77000, February 2008 (pending).
- OSC Cluster Ohio grant, Co-PI (with J. Zhu, A. Baldum, Z.-H. Duan, A. Sokolov and P. Wang), *Computational Study of Ligand-Protein-Nanofiber Interactions for the Development of Biosensors*, 16-node

Itanium cluster, January 2003.

PROFESSIONAL ACTIVITIES

- Program Committee, 3rd International Workshop on Embedded Software Optimization, in conjunction with 2008 IFIP International Conference on Embedded and Ubiquitous Computing, December 17-20 2008, Shanghai PRC.
- Program Committee, IASTED 20th International Conference on Parallel and Distributed Computing and Systems, November 16-18 2008, Orlando FL.
- Program Committee, IEEE 5th International Symposium on Embedded Computing, October 6-8 2008, Beijing PRC.
- Program Committee, IASTED International Conference on Parallel and Distributed Computing and Networks, as part of the 26th International Multi-Conference on Applied Informatics, February 12-14 2008, Innsbruck Austria.
- Program Committee, IASTED 19th International Conference on Parallel and Distributed Computing and Systems, November 19-21 2007, Cambridge MA.
- Session Chair (Algorithms II), ISCA 22nd International Conference on Computers and Their Applications, March 28-30 2007, Honolulu HI.
- Program Committee, IASTED International Conference on Parallel and Distributed Computing and Networks, as part of the 25th International Multi-Conference on Applied Informatics, February 13-15 2007, Innsbruck Austria.
- Program Committee, IASTED 18th International Conference on Parallel and Distributed Computing and Systems, November 13-15 2006, Dallas TX.
- Program Committee, 2006 IFIP International Conference on Embedded and Ubiquitous Computing, August 1-4 2006, Seoul ROK.
 - Paper Reviewer, First International Workshop on Trustworthiness, Reliability and Services in Ubiquitous and Sensor Networks, in conjunction with EUC 2006.
- Program Committee, IASTED 17th International Conference on Parallel and Distributed Computing and Systems, November 14-16 2005, Phoenix AZ.
- Program Committee, ISCA 17th International Conference on Computer Applications in Industry and Engineering, November 17-19 2004, Orlando FL.
- Program Committee, IASTED 16th International Conference on Parallel and Distributed Computing and Systems, November 8-11 2004, Cambridge MA.
- Program Committee, ISCA 19th International Conference on Computers and Their Applications, March 18-20 2004, Seattle WA.
- Program Committee, IASTED 15th International Conference on Parallel and Distributed Computing and Systems, November 3-5 2003, Marina del Rey CA.
- Session Chair (Algorithms I), ISCA 16th International Conference on Parallel and Distributed Computing Systems, August 13-15 2003, Reno NV.
- Session Co-chair (Compilation Techniques), IASTED 14th International Conference on Parallel and Distributed Computing and Systems, November 4-6 2002, Cambridge MA.
- Program Committee, Session Chair (Mobile Networks and Routing) and Assistant to the Program Chair, ISCA 14th International Conference on Parallel and Distributed Computing Systems, August 8-10 2001, Richardson TX.
- Program Committee, 2000 International Conference on Information Technology for the New Millennium, Dec. 18-20 2000, Bangkok Thailand.

- Assistant to the Program Committee Co-Chair, ISCA 13th International Conference on Parallel and Distributed Computing Systems, August 8-10 2000, Las Vegas NV.
- Reviewer for many journals including *The Computer Journal*, *International Journal of Computers and Applications*, *IEEE Transactions on Parallel and Distributed Systems*, *Journal of VLSI Signal Processing*, *IEEE Transactions on Signal Processing*, *IEEE Transactions on Circuits and Systems*, *IEEE Transactions on Computers*, etc.
- Reviewer for discrete math textbook by Thomas Koshy (2002) and Java textbook by Elizabeth Boese (2006).

UNIVERSITY/COLLEGE SERVICE ACTIVITIES

UNIVERSITY OF AKRON (2002-present)

- Dept. Rep., Buchtel College Council, 2005-06 and 2006-07 Academic Years.
- Member, Department Faculty Merit Advisory Committee, Summers 2006 and 2007.
- Coordinator
 - Dept. *Ad Hoc* Committee for Revising Chair Review Guidelines, Spring 2008.
 - Fall 2005 and Fall 2006 “Welcome Back” events.
 - Spring 2007 “C.S. Day” event.
- Search Committee Member
 - Systems Administrator, Computer Science Department, Spring 2008.
 - Assistant Dir. Employer Relations, Center for Career Management, Spring 2005.
 - Assistant Professor, Computer Science Department, Fall 2003.

MANCHESTER COLLEGE (1996-98)

- Dept. Rep., FESP (First-year Experience in the Sciences Program) Committee, 1996-98.
- Faculty Advisor, Student Senate, 1996-98.
- Member, Dept. *Ad Hoc* Committee for Revising Comp. Sci. Major and Minor, 1996-97.
- Member, Dept. *Ad Hoc* Committee for Precalculus textbook selection, 1997.
- Proctor, Math Placement Exams for incoming first-year students, Summers 1997 and 1998.
- Academic advisor to incoming first-year students, Summer Orientation 1997 and 1998.
- Dept. Rep., Campus Visitation Days, 1997-98. (Recruited prospective students).
- Interviewer, Scholarship Days, 1996-98. (Reviewed student eligibility for scholarships.)
- Coordinator for Campus Visit by DPS, Inc. of Indianapolis, October 1997.

REFERENCES

Available on request.