

CURRICULUM VITAE

Richard T. Hurley

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Business Address:

Department of Computing and Information Systems
Trent University
Peterborough, ON, Canada
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Date and Place of Birth: 1962, Fredericton, NB, Canada

Marital Status: Married with one son

Nationality: Canadian

EDUCATION:

Sept. 1984 - University of Waterloo, Waterloo, ON, Canada

July 1991 Ph.D. degree in Computer Science

Thesis: "An Investigation of File Migration in a Distributed File System"

Supervisors: Dr. J. W. Wong, (519) 888-4431

Dr. J. P. Black, (519) 888-4459

Sept. 1980 - University of New Brunswick, Fredericton, NB, Canada

Apr. 1984 B.Sc. degree in Computer Science in First Division,
Minor: Mathematics

GRANTS, SCHOLARSHIPS, and AWARDS:

2007	Trent University Internal NSERC Grant	\$1800
2004	Trent University Academic Innovation Fund	\$975
2002	Trent University Internal NSERC Grant	\$3140
2001	Symons Award for Excellence in Teaching	
1999	Sun Microsystems AEG Grant	\$76,500
1997-98	Trent University Internal NSERC Grant	\$1000
1995-96	Trent University Internal NSERC Grant	\$2200
1992-93	Trent University Internal NSERC Grant	\$4200
1991-92	Trent University Internal NSERC Grant	\$4500
1989-90	Departmental Fellowship	\$4000
1984-88	NSERC Postgraduate Scholarship	\$13,500
1983	NSERC Summer Research Scholarship	\$4000

PROFESSIONAL EXPERIENCE:

- Aug. 1991 - present** Computer Science/Studies Program - Professor and Chair
LOCATION: Trent University
 Peterborough, ON, Canada
 K9J 7B8
COURSES: COIS1010H: Digital World
 COSC102H: Introduction to Software Engineering with C/C++
 COIS1020H: Programming for Computing Systems
 COSC104H: Programming Methodologies
 COST151H: Introduction to Computer Science with Applications
 COSC152H: Introduction to Programming
 COSC202H: Data Structures and Algorithms
 COSC230: Computer Organization
 COIS3050H: Theory of Computation
 COSC332H: Operating Systems
 COIS3380H: Systems Programming
 COSC340H: Database Management Systems
 COSC347H: Modelling and Simulation
 COSC432H: Distributed Systems
 COSC401H/402: Software Engineering
 AMOD581h: Computational Aspects of Modelling
- Granted tenure in July, 1995
 - Promoted to Associate Professor on July, 1997
 - Chairman of Computer Science/Studies Program, Jan. 1999 - Jun. 2007
 - Awarded the Symons Award for Excellence in Teaching in 2001
 - Promoted to Full Professor on July, 2004
- July 1998 - Aug. 1998** Faculty of Computer Science - Instructor
LOCATION: University of New Brunswick
 Fredericton, NB, Canada
DEAN: Dr. Jane Fritz, (506) 447-7287
COURSE: CS2403 - Operating System Principles
- Sept. 1989 - July 1991** Department of Computer Science - Programmer
LOCATION: University of Waterloo
 Waterloo, ON, Canada
SUPERVISOR: Linda Norton, (519) 888-4464
DUTIES: To design and implement a graduate database system for the School of Computer Science. The database system was implemented on using Double Helix for a network of Apple MacIntosh computers.
- Sept. 1984 - July 1991** Department of Computer Science - Teaching Assistant
LOCATION: University of Waterloo
 Waterloo, ON, Canada
DUTIES: To conduct tutorials, set and mark assignments and tests, meet with students, and give occasional lectures. Variety of courses included Distributed Systems, Computer Networks, Database Management, Data Structures, Simulation, and Computer Organization.

- May 1984 -** Defense Research Establishment Atlantic - Research Assistant
Aug. 1984 LOCATION: P.O. Box 1012
Dartmouth, NS, Canada
SUPERVISOR: Dr. Joseph N. Maksym, (902) 426-3100
DUTIES: An object, such as a single ship, generates a set of characteristic manifestations that can be observed as signal features. The knowledge representation language ATHENA was used to simulate the combined manifestations of a randomly chosen set of objects and three different methods were used for inferring the set of objects present.
- May 1983 -** University of New Brunswick - Research Assistant
Aug. 1983 LOCATION: Box 4400
Fredericton, NB, Canada
SUPERVISOR: Prof. John M. DeDourek, (506) 453-4566
DUTIES: Major project was to design, code, and test an error compaction scheme for an interactive Pascal compiler. Other duties included revision of existing routines as well as the implementation and testing of new routines.

PUBLICATIONS:

Refereed Journals

Hurley, R. T., J. Mak and B. C. Domzy, "Performance Comparison of Algorithms for Gathering Remote State Information", *To Appear in the International Journal on Computers and Their Applications*, (Sept. 2009).

Feng, W. and R. T. Hurley, "Ratio Conditions on the Parameters of a Class of Service Systems," *ACIS International Journal of Computers & Information Science (IJCIS)*, Vol. 6, No. 1 (2005), pp. 38 -47.

Feng, W. and R. T. Hurley, "Performance Comparison for Service systems With or Without Anticipated Delay Information by Analysis and Simulation", *International Journal of Computers and Their Applications*, Vol. 11, No. 3, pp. 143-151, (Sept. 2004).

Hurley, R. T. and S. A. Yeap, "File Migration and File Replication: A Symbiotic Relationship," *IEEE Transactions on Parallel and Distributed Systems*, Vol. 3, No. 6, pp. 578-586, (Jun.,1996).

Hurley, R. T., Guest Editor, *Journal of Computing and Information: Special Issue: Proceedings of the 8th International Conference on Computing and Information*, University of Waterloo, June 19-21, 1996, Vol. 2, No. 1, (Nov., 1996).

Hurley, R. T., Guest Editor, *Journal of Computing and Information: Special Issue: Proceedings of the 7th International Conference on Computing and Information*, Trent University, July 5-8, 1995, Vol. 1, No. 2, (Sept., 1995).

Hurley, R. T., Guest Editor, *Journal of Computing and Information: Special Issue: Proceedings of the 6th International Conference on Computing and Information*, Trent University, May 26-28, 1994, Vol. 1, No. 1, (Apr., 1995).

Refereed Conference Publications

Hurley, R. T. and B. Y. Li, "Effects of Dynamic Content on Web Caching," *Proc. of the ISCA 21st International Conference on Parallel and Distributed Computing and Communication Systems (PDCCS'08)*, New Orleans, LA, USA (Sept. 24-26, 2008).

Hurley, R. T. and B. Y. Li, "A Performance Investigation of Web Caching Architectures," *Proceedings of the Canadian Conference on Computer Science and Software Engineering (C3S2E-08)*, Montreal, QC, Canada (May 12-13, 2008).

Zhang, Yong, Wenying Feng and Richard Hurley, *Integration of QoS queuing schedules to QoS caching schemes*, Proceedings of the 5th IEEE/ACIS International Conference on Computer and Information Science (ICIS-2006), Honolulu, Hawaii, USA (July 10-12, 2006).

Hourie, Craig, James W. Jury, and Richard T. Hurley, "An Empirical Comparison of Monte Carlo Methods for Simulating Random Variants that follow Cubic Polynomial Based Mathematical Models", *Proceedings of the 14th International Conference on Intelligent and Adaptive Systems and Software Engineering*, pp. 258-262, Toronto, ON, Canada (Jul. 20-22, 2005).

Hurley, R. T., W. Feng, and B. Y. Li, "Performance Benefits of Partitioning in a Web-Caching Environment", *Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering*, pp. 64-68, Las Vegas, Nevada, USA (Nov. 11-13, 2003).

Hurley, R. T., W. Feng, and B. Y. Li, "Partitioning in Distributed and Hierarchical Web-Caching Architectures: A Performance Comparison", *Proceedings of the 16th International Conference on Computer Applications in Industry and Engineering*, pp. 184-188, Las Vegas, Nevada, USA (Nov. 11-13, 2003).

Feng, W., R. T. Hurley, and Z. Tan, "Increasing Web Cache Hit Rate by Dynamic Location Partitioning", *Proceedings of the 7th Joint Conference on Information Sciences*, pp. 405-409, Cary, North Carolina, USA (Sept. 26-30, 2003).

Hurley, R. T., W. Feng, and B. Y. Li, "An Analytical Comparison of Distributed and Hierarchical Web-Caching Architectures", *Proceedings of the ISCA 18th International Conference on Computers and Their Applications*, pp. 291-295, Honolulu, Hawaii, USA (March 26-28, 2003).

Hurley, R. T. and W. Feng, "The Adverse Effects of Large Files in a File Migration System", *Proceedings of the 17th International Conference on Computers and Their Applications*, pp. 192-197, San Francisco, CA, USA (Apr. 6-8, 2002).

Feng, W. and R. T. Hurley, "Birth-Death Models for a Class of Service Systems", *Proceedings of the 20th IASTED International Conference on Applied Informatics (AI2002)*, pp. 320-325, Innsbruck, Austria (Feb. 18-22, 2002).

Hurley, R. T. and W. Feng, "Performance Results on Scheduling Algorithms for a Broadcast Information Delivery System", *Proceedings of the ISCA 16th International Conference on Computers and Their Applications (CATA-2001)*, pp. 247-250, Seattle, WA, USA (Mar. 28-30, 2001).

Hurley, R. T. and B. F. Hircock, "Benefits of Vertical File Migration in a Horizontal File Migration System," *IASTED International Conference on Parallel and Distributed Computing Systems*, pp. 365-370, MIT, Boston, MA, USA (Nov. 3-6, 1999).

Hurley, R. T., J. W. Wong, and J. P. Black, "The Effect of Out-Dated State Information on File Migration", *10th International Conference on Parallel and Distributed Computing Systems*, pp. 433-437, New Orleans, LA, USA (Oct. 1-3, 1997).

Hurley, R. T., J. P. Black, and J. W. Wong, "Limited Effects of Finite Storage on a Beneficial File Migration Policy," *Proceedings of the 19th Conference on Local Computer Networks*, pp. 432-439, Minneapolis, MN, USA (Oct. 2-5, 1994).

Hurley, R. T., S. A. Yeap, , J. W. Wong, and J. P. Black, "Potential Benefits of File Migration in a Heterogeneous Distributed File System", *Proceedings of ICCI'93: 5th International Conference on Computing and Information*, pp. 123-127, Sudbury, ON, Canada (May 27-29, 1993).

Hurley, R. T., J. P. Black, and J. W. Wong, "Modelling and Investigation of a Primitive File Transfer Operation," *Proceedings of ICCI'92: 4th International Conference on Computing and Information*, pp. 461-465, Toronto, ON, Canada (May 28-30, 1992).

Hurley, R. T., J. W. Wong, and J. P. Black, "Performance of File Migration in a Distributed File System," *Proceedings of ICC-90: 10th International Conference on Computer Communications*, pp. 685-692, New Delhi, India (Nov. 5-9, 1990).

Vernon, A. J., R. T. Hurley, J. W. Wong, J. A. Field, and J. P. Black, "Queuing Analysis of Transport Layer Connections in an Internet Environment," *IEEE International Conference on Communications '89*, pp. 658-664, Boston, Mass. (Jun. 11-14, 1989).

Technical Reports

Palbom, J. and R. T. Hurley, "Computers and the Physically Challenged", *Technical Report, Computer Studies Program*, Trent University, Peterborough, ON (Dec. 1993).

Hurley, R. T., "An Investigation of File Migration in a Distributed File System," Ph.D. Thesis, *CCNG Technical Report T-213*, Computer Communications Networks Group, University of Waterloo, Waterloo, ON (Jan. 1992).

RESEARCH INTERESTS:

Currently, I am conducting research in a number of areas. My primary area of research is in the performance of resource management strategies for distributed systems. I have also been working with Dr. Jury and a team from the University of Melbourne on using digital technology to enhance the resolution of gamma cameras for diagnostic imaging. Finally, and most recently, I have been working with the Special Needs Department at Trent and Dr. Keith Bain at St. Mary's University to investigate how new applications of speech recognition (SR) technology can be used to provide a barrier-free learning environment for all students (referred to as Liberated Learning).

Performance of Resource Management Strategies

The primary focus of my research is in the architecture and performance of distributed systems and wireless computer networks. More specifically, my research involves the design and evaluation of resource management strategies for high-powered distributed systems (which extend to the WWW). A combination of analytic and simulation models are used to study the theoretic performance of systems and policies developed. The current topics include: performance of file management systems, policies for gathering of remote state information, web-caching, dynamic web content, and bandwidth allocation in wireless networks.

Digital Enhancement of Gamma Cameras for Diagnostic Imaging

Current-technology gamma cameras are in widespread use for human diagnostic radiology. However, these cameras suffer from limited spatial resolution (5 to 8 mm) and from a severe problem when high rates of gamma ray image acquisition occur and as a result, information is lost and radiation doses to patients are unnecessarily elevated. Using high-speed processors, we intend to digitally analyze each gamma ray signal as it is presented by the detector to increase dramatically the sensitivity of a gamma camera. Thus, very weak pulses can be utilized in forming the image of the patient. This should result in greatly enhanced image resolution (perhaps as much as 2 to 4 mm).

Liberated Learning

Liberated Learning attempts to provide a barrier-free learning environment for all students. Using advanced Speech Recognition Software bundled with text and voice display management components, students are provided with additional resources to aid in their learning. Students with learning challenges, hearing losses, or whose first language is not English benefit from being able to see the text of lecture as it is being delivered. Students with visual challenges or students who were not able to make it to class can use the electronic voice and/or text transcripts to fill in missing information. Using voice/text transcripts of lectures coupled with course notes, text books, and competent electronic contacts (email, instant messaging, etc.), there is excellent set of resources to support students who may be geographically dispersed. The research in this area involves trying to improve the accuracy of the software recognition software (currently between 70% – 90% accurate), enhancing the tools which create the text and voice files, and extending the environment to allow the efficient creation of accessible, on demand E-Content for E-Learning applications.

GPGPU Computing for Ray Tracing

General purpose graphics processor unit (GPGPU) computing is the newly emerged field of running general purpose software on graphics hardware. The motivation for this is that graphics hardware has tremendous performance in specific cases, at the expense of more general features of the traditional central processing unit (CPU). GPGPU is a different paradigm, both in hardware architecture and software design, from the traditional serial approach, and is of great interest to many

fields. One of the objectives of this research is to adapt to the new programming and architecture framework in order to implement novel and higher performance solutions to traditional problems. Ray tracing is a well understood discipline, seeing use in the movie industry already. However present ray tracing requires small (or sometimes large) clusters of computers which are extremely expensive, and in many cases custom architectures. As the computation power of GPUs has increased, some of that functionality is becoming available on the average desktop. Much of this project is concerned with transitioning ray tracing techniques and paradigms from large clusters of expensive machines to single cards which are of the desktop computer.

GRADUATE SUPERVISION:

i) Graduate Students Completed

Brian Hircock: M.Sc.- Jan. 1998

Thesis Title: "Horizontal and Vertical File Migration in a Distributed File System"

Bingyu Li: M.Sc.- Apr. 2002 (co-supervised)

Thesis Title: "An Investigation of Partitioned Caching in the World Wide Web"

John Mak: M.Sc.: Dec. 2002

Thesis Title: "Performance of Resource Management Strategies in Distributed Systems"

Craig Hourie: M.Sc.: Jan. 2005 (co-supervised)

Thesis Title: "An Empirical Comparison of Monte Carlo Methods for Simulating Random Variants that follow Cubic Polynomial Based Mathematical Models"

Yong Zhang: M.Sc.: Sept. 2006 (co-supervised)

Thesis Title: "QoS in Web-Caching Systems"

Brian Srivastava: M.Sc.: Oct. 2008

Thesis Title: Dynamic Ray Tracing Using the Graphics Processing Unit

ii) Graduate Students Currently Supervised:

Eric Marvin: M.Sc.: commenced September 2007.

Graeme Young: M.Sc.: commenced September 2008.

GRADUATE SUPERVISORY COMMITTEES:

- 1) Eva Webster (M.Sc. - 1994) AMOD Program, Trent University
- 2) Alma Barranco (M.Sc. - 1995) AMOD Program, Trent University
- 3) Ray Fritz-Nemeth (M.Sc. - 1997) AMOD Program, Trent University
- 4) Thomas Barry (M.Sc. - 2000) AMOD Program, Trent University
- 5) Jeff McMahan (M.Sc. - 2000) AMOD Program, Trent University
- 6) Dawit Haile (M.Sc. - 2002) AMOD Program, Trent University
- 7) Don McCallum (M.Sc. - 2002) AMOD Program, Trent University
- 8) Huiyi Zhang (M.Sc. - 2004) AMOD Program, Trent University
- 9) Michael Jack (M.Sc. - 2004) AMOD Program, Trent University
- 10) Tom Wisniewski (M.Sc. - 2006) AMOD Program, Trent University
- 11) Jamie Mitchell (M.Sc. - 2006) AMOD Program, Trent University
- 12) Michael Gowanlock (M.Sc. - 2008) AMOD Program, Trent University

COMMITTEES and ASSOCIATIONS:

- Chair, Computer Science/Studies Program: 1998 - 2007
- Acting-Chair, Global Studies Emphasis: 2005-2007
- Computer Science/Studies Committees:
 - Personnel Committee
 - Tenure-Track Hiring Committee: 1997, 2000, 2001, 2003, 2007
 - Chair, Tenure Hearing Committee: 1998, 2002, 2003, 2004
 - Chair, Merit Award Committee: 1999-present
 - Curriculum Committee
 - Timetable Representative: 2001-present
 - Equipment Sub-Committee for Computer Studies
 - Computer Liaison with CTS
- Acting Director of the Applications of Modelling (AMOD) Graduate Program: Jan/98-Jun/98
- TUFA Executive member: Sept. 2001 - Apr. 2007, May 2008 - present
- TUFA Salaries and Benefits Officer for TUFA: 2002 - 2007, May 2008 - present
- TUFA Negotiations team: 2002, 2005
- TUFA representative on Faculty Board: 2002 - 2007
- TUFA representative on Special Needs: 1996 - 2007, 2008
 - Chairman of the Physical Access Sub-Committee
- TUFA Pension Committee: 2004 - 2007
- TUFA Vice-President: 2006/07
- TUFA Treasurer: 2006/07, 2008/09
- Instructor in the Trent Enrichment Program: 1996 - 2000
- Instructor in the Elderhostel Program: 1996 - 1997
- Instructor in the Non-Credit Continuing Education Program: 1997
- Selection Committee for Associate Dean of Science: 1998, 2005
- Selection Committee for Chairman of Math Department: 1999, 2002, 2009
- Search Committee for Chair of Philosophy: 2002
- Search Committee for Director of Information Technology: 2002/03
- Chair, OC Head Search Committee: 2003
- Senate: 1999 - 2001, 2005-2007
- Committee on Technology and Learning: 1999 - 2003
- University Disability Access Plan Committee: 2002/03
- Joint Committee to Investigate Salary Model: 2003 - 2006
- Continuing Education Committee: 2003-2005, 2008/09
- Committee on Academic Personnel: 2006/07
- Canadian Information Processing Society (CIPS): 2001 - present
- Computer Science Accreditation Council: 2001 - 2007
- Association for Computing Machinery (ACM): 1988 - present
- Institute of Electrical and Electronics Engineers (IEEE): 1989 - present
- Board of Directors of the Five Counties Childrens Center: 1995 - 2005
- Kiwanis Park Neighborhood Association: 1994 - 2004
 - Formed to raise money for a wheelchair-accessible playground equipment. To date, we have raised over \$30,000 and have installed two phases of the equipment. The first phase was installed in Sept., 1994 and the second was installed in Aug., 1995. The third phase was installed in the Spring of 1997.
 - Received a City of Peterborough Civic Award for Community Betterment in 1994