

Curriculum Vitae

Marshall Walker
Professor Emeritus
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Degrees Received

Ph. D. Mathematics - 1973 - University of Toronto
M.A. Mathematics - 1967 - University of California Santa Barbara
B.A. Mathematics - 1963 - Reed College, Portland Oregon

Employment History

2016- present	Professor emeritus, Mathematics and Information Technology, York University
2005 -2016	Professor, Mathematics & Information Technology, York University
1977 - 2005	Associate Professor, Mathematics, York University
1990 - 1991	Software Consultant, Michael Mather Associates
1985 - 1986	Mathematics Team Leader, WYDA Systems , Toronto
1983 - 1984	Visiting Associate Professor, Mathematics, Stanford University
1972 - 1977	Assistant Professor, Mathematics, York University
1970 - 1972	Lecturer, Mathematics, York University
1969 - 1970	Instructor, Mathematics, York University
1964 - 1965	Software Analyst, Applied Data Systems, San Francisco
1964	System Analyst, Bechtel Corporation, San Francisco
1963 - 1964	Programmer, Consolidated Freightways, Portland, Oregon

Scholarly and Professional Activities

2009 - 2010	Director School of Information Technology
2003 - 2007	Chair School of Analytic Studies and Information Technology
2000 - 2003	Member of Organizing Committee for International Workshop on the Future Role of Geometry in Industry
2000 - 2001	Coordinator Mathematics Programme, School of Analytic Studies and Information Technology, Atkinson Faculty of Liberal and Professional Studies

1998 - 2000	Chair, Department of Computer Science and Mathematics, Atkinson College, York University
1992 - 1995	Chair, Department of Computer Science and Mathematics Atkinson College, York University
1986 - 1988	Chair, Department of Computer Science and Mathematics, Atkinson College, York University
1986 - 1987	Coordinator of York University CAD CAM and Robotics Research Group
1985 - 1987	President of Canadian Society for History and Philosophy of Mathematics
1983 - 1985	Vice President of Canadian Society for History and Philosophy of Mathematics
1980 - 1983	Chair, Department of Computer Science and Mathematics, Atkinson College, York University

Ph.D. Student

Achan Lin – thesis completed September 2003 – title: Bézier Curves and Surfaces-a New Approach

Service to the University Community

- Director School of Information Technology (2009-2010)
- Chair School of Analytic Studies and Information Technology (2003-2007)
- Atkinson Task Force on Reorganization
- 5 two year terms as Chair of the Atkinson College Faculty Council
- 3 one year terms as Secretary of the Atkinson College Faculty Council
- 7 three year terms as a member of the York University Senate
- 1 two year term as a member of the Senate Appeals Committee
- 1 one year term on YUFA negotiating committee
- multiple terms on most faculty/college committees, including Tenure and Promotion, Examinations and Academic Standards, Policy and Planning, Curriculum, and Research

Teaching

In recent years:

Undergraduate

Math 1700 6.0, The Nature and Growth of Mathematics, historically based showing the role of mathematics in the development of modern society.

Math 1710, Fundamentals of Mathematics, a bells and whistles pre-calculus/calculus internet course
<http://yorku.ca/math1710>

Math 1300, Differential Calculus with Applications

Math 1310, Integral Calculus with Applications

Math 1190, Introduction to Sets and Logic

Math 2270, Differential Equations

Math 3110, Introduction to Mathematical Analysis

Math 3210, Principles of Mathematical Analysis

Math 3500, Mathematics in the History of Culture, developed in 2003-04 using original material

Math 4110, Mathematical Analysis

Math 4250, Differential Geometry

Graduate

Math 6003, Geometric Modeling

Math 6540, Topology

Math 6550, Algebraic Topology

Recent Research Support and Merit Awards

- Atkinson Faculty Minor Research Grants:
 - 1999-2000 \$1384 Triangular Mesh Interpolation
 - 2000-2001 \$1200 Computer Aided Geometric Design on Manifolds
 - 2004-2005 \$ 600 Computer Aided Geometric Design Techniques for Approximation and Interpolation in Manifolds
- York University Specific Research Grant
 - 2005 \$4300 Surfaces on Surfaces
- Atkinson Faculty Merit Awards -
 - For each of the years that they have been awarded.

Publications

I. Papers in Refereed Journals

1. "Homotopy Pull-backs and Applications to Duality", Canadian Journal of Mathematics (1), 29(1977), 45-64

2. "Homotopy Pull-backs and the Hopf-Invariant", *Journal of the London Mathematical Society* (2), 19(1979), 153-158.
3. (With Michael Mather), "Commuting Homotopy Limits and Colimits", *Mathematische Zeitschrift*, (1980), 175-180.
4. "Golden Cuboid Sequences", *Fibonacci Quarterly*, May 1985.
5. "Hidden Line Detection in Polytree Representations", *Comput. & Graphics* (1), 12(1988), 65-68.
6. "Boolean Operations with Enriched Octree Structures," *Comput. & Graphics* (4), 13 (1989), 487-495.
7. "Interpolation with Hybrid B-spline Surfaces", *Comput. & Graphics*, (4),18(1994), 535-530.
8. "Recent experience with transfinite interpolation", *Computer Aided Geometric Design* (2), 16(1999), 77-83.
9. "Hermite Interpolation of Space Curves using the Symmetric Algebra", *Computer Aided Geometric Design* (4), 22(2005), 299-319.

II. Fully Refereed Papers in Books

1. "Interpolation of an Arbitrary Rectangular Mesh with Local Control and Prescribed Continuity" , *Wavelets, Images, and Surface Fitting*, Ed. Pierre-Jean Laurent / Alain LeMehaute / Larry Schumaker, A.K. Peters (1994), 501-510.
2. "Hybrid B-Spline Interpolants", *The Mathematics of Surfaces VI*, Ed. Glen Mullineux, Clarendon Press, Oxford (1996), 453-462.
3. "Adding constraints to Gordonesque surfaces", *Mathematical Methods for Curves and Surfaces*, Ed. Morten Daehlen, Tom Lyche, and Larry Schumaker, Vanderbuilt Press, 1998.
4. "Interpolation of an arbitrary triangular mesh with high degree geometric continuity", *The Mathematics of Surfaces VIII*, Ed., Robert Cripps, Oxford University Press, 1998.
5. "Approximation in differential manifolds", *Algorithms for Approximation IV*, Levesley, J, Anderson, I., Mason, J, editors, The University of Huddersfield, 2002.
6. "Proto-Bézier Simplices and Hermite Approximation to Curves", *Geometric Design and Computing*, Miriam Lucian and Mike Neamtu (eds.) Nashboro Press (2004), 387-404.
7. "Fundamental Bézier Simplices", *Mathematical Methods for Curves and Surfaces Tromso 2004*, M. Daehlen, K. Morken, and L.L. Schumaker (eds), Nashboro Press (2005), 101-114.

III. Refereed Conference Proceedings

1. "Labeled Three_Cell Complexes - A Representation Format for Solid Modeling", *IEEE Montech Proceedings, Conference Comprint '87*, November 9-12 (1987), 106-109.

IV. Conference Abstracts

1. "When Homotopy Limits Commute", Notices of the American Mathematical Society 26, (1980), 646.
2. "An Interpretation of Plato's Timaeus", Abstracts of the American Mathematical Society, Aug. 1982, Vol.3, No. 5, 385.

V. Conference Presentations

1. "A Dual Sugawara Theorem", 32nd Ontario Mathematics Meeting, October 19, 1974.
2. "Higher Homotopies and Duality", 33rd Ontario Mathematics Meeting, November 30, 1974.
3. "When Homotopy Limits Commute", American Mathematical Society Conference, Riverside California, Nov. 1980.
4. "Mean and Extreme Ration in Plato's Timaeus", Conference of the Canadian Society for History and Philosophy of Mathematics, June 1982.
5. "An Interpretation of Plato's Timaeus", American Mathematical Society Summer Meeting, Toronto, August 1982.
6. "The Mathematical Commentary on Plato's Timaeus", Conference of the Canadian Society for History and Philosophy of Mathematics, June 1984.
7. "Homotopy Limits of Polyhedrally Enriched Diagrams" 67th Ontario Mathematics Meeting, February 15, 1985.
8. "Homotopy Deformations and Solid Modeling", Wayne State Research Conference on Geometric Design, May 4-6. 1987.
9. "Catmull-Rom Surfaces", First SIAM Conference on Geometric Design, Tempe Arizona, November 6-10, 1989.
10. "Catmull-Rom Splines in Geometric Modeling", Wayne State, Research Conference on Geometric Design, May 3-7, 1990.
11. "Interpolation with Catmull-Rom Surfaces", Second SIAM Conference on Geometric Design, Tempe, Arizona, Nov. 4-8. 1991.
12. " C^n Local Control Interpolation of an Arbitrary Mesh", Second International Conference Curves and Surfaces Conference, Chamonix Mont Blanc, France, June 10-16, 1993.
13. " C^n Interpolation of an Arbitrary Rectangular Mesh", Third SIAM Conference on Geometric Design, Tempe, Arizona, Nov. 1-5, 1993.
14. "Hybrid B-Spline Interpolation", IMA Conference on Curves and Surfaces, Brunel University, Sept. 4-6, 1994.
15. "Deforming Hybrid B-Spline Surfaces", MCAD Conference, Oakland University, Michigan, May 1995.
16. "Adding Handles to Hybrid B-Spline Surfaces", Fourth SIAM Conference on Geometric Design, Nashville, Tenn., November 6-9, 1995.
17. "Transfinite Interpolation with Constraints and Local Control", Third International Conference Curves and Surfaces, Chamonix Mont Blanc, France, June 27 – July 3, 1996
18. "Attaching Gordonesque Surfaces", The Fourth International Conference on Mathematical Methods for Curves and Surfaces, Lillehammer, Norway, July 3-8, 1997.

19. "Connecting Gordonian Surfaces", The Fifth SIAM Conference on Geometric Design, Nashville, Tenn, November 3-6, 1997.
20. "Interpolation of an arbitrary triangular mesh", 8th IMA Conference on the Mathematics of Surfaces, Birmingham, August 30- September 2, 1998.
21. "Parametric Radial Interpolation in Polar Coordinates", Fourth International Conference organized by AFA-SMAI on Curves and Surfaces, Saint-Malo, France, July 1-7, 1999
22. "A Paradigm for triangular mesh interpolation", Sixth SIAM Conference on Geometric Design, Albuquerque, New Mexico, November 2-5, 1999.
23. "CAGD curve construction over a sphere" Fifth International Conference on Mathematical Methods for Curves and Surfaces, Oslo, Norway June 29 - July 4, 2000.
24. "Approximation on differential manifolds, The Fourth International Symposium on Algorithms for Approximation, Huddersfield, United Kingdom, July 15 –20, 2001.
25. "CAGD Approximation and Interpolation in 2-Manifolds", Fifth International Conference organized by AFA-SMAI on Curves and Surfaces, Saint-Malo, France, June 27 – July 3, 2002.
26. "Proto-Bézier Simplices - applications to geometric Hermite interpolation" Eighth SIAM Conference on Geometric Design, Seattle, Washington, November 10-13, 2003
27. "Fundamental Bézier Simplices", The Sixth International Conference on Mathematical Methods for Curves and Surfaces, Tromsø, Norway, July 1-6, 2004.
28. "Algorithms for Parametric Surfaces" Algorithms for Approximation 5, Chester, United Kingdom, July 18-22, 2005.
29. "Spline Curves and Surfaces over Spheres and Developable Surfaces", Sixth International Conference organized by SMAI-AFA on Curves and Surfaces, Avignon, France, June 29 – July 5, 2006.
30. "Interpolation with Scaled Gaussian Radial Basis Functions - Application to Constructing Surfaces over Surfaces," Tenth SIAM Conference on Geometric Design and Computing, San Antonio, Texas, November 4-8, 2007.
31. "Interpolation with Scaled Gaussian Radial Basis Functions", The Seventh International Conference on Mathematical Methods for Curves and Surfaces, Tonsberg, Norway, June 26 - July 1, 2008
32. "C-infinity Interpolation with local Control using scaled Gaussians", Seventh International Conference organized by SMAI-AFA on Curves and Surfaces, Avignon, France, June 24 – June 30, 2010.