Curriculum Vitae

Chehrzad (Cheri) Shakiban
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Educational Data

Sc.B. 1973	National University of Iran Mathematics, With Honors
Ms. 1976	Harvard University Mathematics
Ph.D. 1979	Brown University Mathematics

Professional Experience

- Part-time Instructor in Mathematics, University of Oxford, England, 1979.
- Visiting Instructor, School of Mathematics, University of Minnesota, 1980-81.
- Assistant Professor, Dept. of Mathematics, College of St. Catherine, St. Paul, MN., 1981-1983.
- Assistant Professor, Dept. of Mathematics, College of St. Thomas, St. Paul, MN., 1983-1990.
- Associate Professor, Dept. of Mathematics, University of St. Thomas, St. Paul, MN., 1990-1996.
- Professor, Dept. of Mathematics, University of St. Thomas, St. Paul, MN., 1996-present.
- Chair of the Dept. of Mathematics, University of St. Thomas, St. Paul, MN., July 1996 - Present.

Research Grants

Summer 1984: Research assistance grant from the Faculty Development Center, College of St. Thomas, on Fractal Geometry.

1987-88: Maxi-grant from the Faculty Development Center, College of St. Thomas, on Symbolic Manipulation in Calculus of Variations.

1989-1991: **(External grant)** National Science Foundation DMS 89-07578

1992-93: Sabbatical Grant, visiting University of Maryland.

1993-94: Teaching Enhancement Grant: to teach a Lab-based Calculus course with *Mathematica*.

1996-97: CRITF grant to teach a pilot course in Finite Math with Excel.

1997-1998: Young Scholar Research grant, with student Smita Myran on Computer Vision.

1999-00: CAM research Grant, Univ. of St. Thomas, with student Janine Bergstedt on Fractal

Geometry.

1999-00: (External grant) The Sonia Kovalevsky High School Mathematics Day Symposium grant from AWM, National Science Foundation, Fall 1999.

Summer 2000: CAM research Grant, Univ. of St. Thomas, with Colleen Duffy on Stability of Structures..

Summer 2000: CAM research Grant, Univ. of St. Thomas, with Aaron Ames on Three-Dimensional Object Recognition using Invariant Euclidean Signature Curves.

Summer 2001: CAM research Grant, Univ. of St. Thomas, with Colleen Duffy on Symmetry and Music..

Summer 2001: CAM research Grant, Univ. of St. Thomas, with Brian Hanson on Fractal Music.

Summer 2001: Young Scholar Research Grant, with student Colleen Duffy on Nonlinear Stability of Structures.

Spring 2002: Sabbatical Grant, École Polytechnique Fédérale De Lausanne (EPFL), Swistzerland.

2003-04: Bush Foundation Grant, Enhance Inquiry Based Learning in Applied Linear Algebra through Mathematical Modeling.

Summer 2003: CAM research Grant, Univ. of St. Thomas, with Ryan Loyd on Latent Semantic Analysis.

January 2004: (External review) UMAIE course Arabesque: Mathematical Symmetry of Southern Spain to be offered during the January 2004.

2002-2005: (External grant) National Science Foundation grant CSEMS, Computer Science, Engineering and Mathematics Scholarships at the University of St. Thomas for the amount of **$400,000.00** for four years supporting over 100 students majoring in Computer Science, Engineering and Mathematics.

Professional Societies

Mathematical Association of America (M.A.A.)
Project Kaleidoscope (PKAL)
Mathematicians and Education Reform (MER)
Association for Women in Mathematics (AWM)
Council for Undergraduate Research member (CUR)

List of Talks Given:

Please note:

invited speaker means that I was invited by someone from that institution or the organizers of the conference to give a talk.

Refereed Abstract means that I sent the abstract of my talk that was reviewed and accepted by the organizing committee before I was invited to give a talk.

On Fractal Geometry:

1. *Iteration of quadratic maps*, Math Seminar, College of St. Thomas, Spring, 1985.
2. *Fractal Geometry of Nature*, Brown Bag Seminar, College of St. Thomas, Spring, 1985.
3. *Fractal Geometry*, Utah State University, **invited Speaker,** Summer, 1985.
4. *Fractal Geometry*, Mathematical Association of America (North Central Section), March, 1986.
5. *Fractal Geometry*, **invited speaker**, Macalester College, April, 1986.
6. *Symmetry of Fractal Geometry*, **invited speaker**, St. Johns College, May 1986.
7. *Fractal Geometry*, Math Club, College of St. Thomas, May 1986.
8. *Fractal Geometry of Nature*, **invited speaker**, Program for High School Teachers, Summer, 1986.
9. *The Art of Mathematics in Graphing Snowflakes*, College of St. Thomas, Fall, 1986.
10. *Fractal Geometry*, **invited speaker**, Macalester College, March, 1988.
11. *Mathematics of Graphing Snowflakes*, NCS/MAA, **invited speaker**, Summer Seminar on The Mathematics of Computer Graphics, Carleton College, Mn., Summer, 1989.
12. *Chaos Seminar*, College of St. Thomas, April 5, 1990.
13. *Mathematics of Graphing Snowflakes*, **invited speaker**, Trinity College, Washington D.C., March, 1992.
14. *Fractals and Chaos,* presenter at the Follow-Up of the Geometry Workshop, August 13, 1998, University of St. Thomas.
15. *Generalized Koch Snowflakes*, **refereed abstract,** Bridges Conference, Kansas, July 2000.
16. Fractal Music, with Brian Hansen, **refereed abstract,** Bridges Conference, Baltimore, July 2002.

On Algebraic Calculus of Variations:

1. *Calculus of Variations*, Brachistochrone problem", Math Seminar, College of St. Thomas, Fall, 1983.
2. *The Euler Operator*, Math Seminar, College of St. Thomas, Fall, 1983.
3. *An Invariant Theoretic Characterization of Conservation Law*s, **refereed abstract**, The 807th meeting of the American Mathematical Society, Fall, 1983.
4. *Conservation Laws of Evolution Equations*, **invited speaker**, Mathematical-Physics, NATO Project, **Istanbul, Turkey**, March 1987.
5. *Dissipative Decomposition of Differential Equations*, **invited speaker**, Mathematical Physics Seminar, University of Minnesota, Fall, 1987.
6. *Dissipative Decomposition of Differential Equation*s, **invited speaker**, Ukrainian Academy of Sciences of the U.S.S.R., **Kiev, U.S.S.R**., Spring, 1989.
7. *Dissipative Decomposition of Partial Differential Equations*, **invited speaker**, Mathematical Physics Seminar, University of Minnesota, Jan, 1991.
8. *Dissipative Decomposition of Partial Differential Equations*, **refereed abstract**, The Fifth Annual Gregynog Conference of Differential Equations, **Wales, United Kingdom**, July 7-14, 1991.
9. *Dissipation and Conservation*, CAM Seminar Series, University of St. Thomas, October, 1994.

10. *Dissipation and Conservation*, **refereed abstract**, Equa Diff 95, Seminar Series, **Lisbon, Portugal,** July, 1995.

On *MATHEMATICA*:

1. *Mathematica in the Calculus of Variations*, **refereed abstract**, Mathematica Conference, Red Wood, California,
2. *Mathematica*, Mathematics Seminar, College of St. Thomas, March, 1990.
3. *Mathematica and Calculus*, **invited speaker**, Mathematics Colloquium, University of Wisconsin, Eau Claire, Wisconsin, March 29, 1990.
4. *Mathematica and the Curriculum,* **invited speaker**, Mathematics Colloquium, Augsberg College, April 11, 1990.
5. *Mathematica in Mathematics*, **invited speaker**, Pi-Mu-Epsilon meeting, College of St. Catherine, April 18, 1990.
6. *Use of Mahematica in Mathematics Course*s, **invited speaker**, Bush Computing Community College Faculty and Instruction Conference, Craygon Resort, Minnesota, August 21, 1990.
7. *Mathematica in Mathematics*, **invited speaker**, St. John University, Collegeville, Minnesota, March 5, 1991.
8. Workshop Presenter on " *Mathematica*", University of St. Thomas, June, 1995.

On Computer Vision:

1. *Curvature in Computer Vision*, CAM seminar, February 1997, University of St. Thomas.
2. *Curvature in Computer Vision*, North Sectional Meeting of American Mathematics Society at University of Minnesota in Mankato, April 1997.
3. *Curvature in Computer Vision*, **refereed abstract,** IMAC conference, July 1997, **Maui, Hawaii.**
4. *Signature Curves applied to Object Recognition*, **invited speaker**, Applied Mathematics Seminar, University of **Tel Aviv, Israel**, June 2, 1998.
5. *Signature curves for object recognition in computer vision*, **invited speaker**, Analysis Seminar, University of Texas, Austin, January, 1999.
6. *Numerical Methods used in Signature curves*, Analysis Seminar, University of St. Thomas, April, 2000.
7. A Numerical approach in Approximating Signature Curves, **refereed abstract**, International Symposium on Analysis, and Computing, **Dalian, China**, August 2000.
8. *Signature Curves and DNA,* École Polytechnique Fédérale De Lausanne (EPFL), **Lausanne, Switzerland**, May 2002.",
9. *Moving Frames and DNA Supercoiling,* **invited speaker**, the International Conference on Geometry, Integrability and Quantization, **Varn, Bulgaria**, June 2003.

Publications:

[1] Shakiban, C.,***The Euler Operator in Calculus of Variations***, thesis, Brown University.

[2] Olver, P.J. and Shakiban, C., ***A resolution of the Euler operator***, paper, *Proceedings of the Eighth National Mathematics Conference*, M. Nouri-Moghadam, ed., Arya-Mehr Univ. Tech., Tehran, 1977, pp.325-337.

[3] Olver, P.J. and Shakiban, C., **A *resolution of the Euler operator I,*** paper, *Proc. Amer. Math. Soc.* **69** (1978), 223-229.

[4] Shakiban, C., ***A resolution of the Euler operator II,*** paper, *Mathematics. Proceeding.of Cambridge . Phil. Soc.* **89** (1981) 501-510.

[5] Shakiban, C., ***An invariant theoretic characterization of conservation laws,*** paper, **(One of the top 5 mathematics journals in the world)** *Amer. Jour. of Math.,* Vol. 104. No. 6, (1982) 1127-1152.

[6] Olver, P.J. and Shakiban, C., ***Dissipative decomposition of ordinary differential equations***, paper *Proc. Roy. Soc. Edinburgh* **109A** (1988), 297-317.

[7] Olver, P.J. and Shakiban, C., ***Graph theory and classical invariant theory***, paper, *Adv. in Math.* **75** (1989), 212-245.

[8] Shakiban, C., Fractal Geometry of Nature, article, St. Thomas Alumni magazine, Feb. 1990.

[9] Olver, P.J., and Shakiban, C., ***Dissipative decomposition of partial differential equations,*** paper, *Rocky Mountain J. Math.* **22** (1992), 1483-1510.

[10] Shakiban, C., ***Harmony of Science and Religion*** , article, Summer Seminar Series on Science and Religion, 1996.

[11] Shakiban, C. and Smitha M., (student), ***Computer Vision***, refereed abstract, NCUR National meeting, 1998.

[12] Calabi, E., Olver, P.J., Shakiban, C., Tannenbaum, A., and Haker, S., paper, ***Differential and numerically invariant signature curves applied to object recognition,*** *Int. J. Computer Vision* **26** (1998) 107-135.

[13] Williams, M. Q., and Shakiban, C., article,. ***Implementing Performance Assessment in the Major, A collection of Papers on Self-Study and Institutional improvement,*** NCA, (2000), 180.

[14] Shakiban, C. and Bergstedt, J.(student), ***Generalized Snowflakes,*** **(refereed paper)** Proceedings of the Bridges Conference, July, 2000.

[15] Shakiban, C., and Duffy, Colleen (student), ***Linear Stability of Geometrical Structures –*** refereed abstract was published, Argonne National Lab Reports, Fall ,2001.

[16] Shakiban, C. and Hansen, B., ***Fractal Music,*** **(refereed paper)**, Proceedings of Bridges of Mathematics, July 2002.

[17] Hennessey, M. and Shakiban, C. and Shvartsman, M, ***Characterizing Slop in Mechanical Assemblies Using Differential Geometry***, the Journal of Computing and Information Science in Engineering, September 2002.

[18] Shakiban, C. and Jelkio, J. and Ames, A., (student) on ***Three-Dimensional Object Recognition using Invariant Euclidean Signature Curves***, **(refereed paper),** Proceedings of International Symposium on Analysis, and Computing, China, Fall 2002.

[19] Shakiban, C. and Lloyd, P (student) on ***Computer Vision Applications Associated with the Euclidian Signature Curve Statistics*****,** refereed abstract was published, Argonne National Lab Reports, Fall 2002.

[20] Shakiban, C. and Lloyd, P. (student) on **Signature Curves Statistics of DNA Supercoils**

(refereed paper) accepted for publication at the proceedings of the International Conference on Geometry, Integrability and Quantization, September 2003.

Pre-prints. These are the papers that are completed and ready to be submitted.

[1] Shakiban, C, and Lloyd, Ryan. (student) on ***Latent Semantic Analysis***, Preprint, 2003.

In prepration: These are the papers I will be working on for publication.

[1] Shakiban, C.***, Invariant Signature Curves in 3D***, in preparation.

[2] Shakiban, C.***,*** and Lloyd, Peter. (Graduate student, University of Mn.) ***Signature Curves of protein molecules in 3D***, in preparation***.***

[3] Shakiban, C, and Lloyd, Ryan. (student) on ***Applications of Latent Semantic Analysis to Computer Vision*** , in preparation.

Manuscripts: Lecture notes available on line - not published:

[1] Shakiban, C., ***Excursions in Mathematics with Mathematica,*** 1992.

[2] Shakiban C., ***Exploring Calculus with Mathematica***., 1994.

[3] Shakiban C., and Smeltzer, D. ***Excel Projects in Finite Mathematics***, 1996.

[4] Shakiban, C., ***Symmetry with Mathematica,*** 2000.

Books For Publication:

[1] Olver P. and Shakiban C. ***Applied Linear Algebera***, Prentice--Hall, Inc., Englewood Cliffs, N.J., in preparation.

[2] Olver P. and Shakiban C, ***Applied Mathematics,*** Prentice--Hall, Inc., Englewood Cliffs, N.J., in preparation.