Curriculum Vitae
Jorge Viveros

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Education:

PhD in Mathematics (November 2007)
Georgia Institute of Technology -U.S.A

M.Sc in Mathematics (July 2004)
Georgia Institute of Technology -U.S.A.

B.Sc in Mathematics (September 1997)
Universidad Nacional Autonoma de Mexico -Mexico

Professional Experience:

2006 - 2008	Assistant Professor of Mathematics Tarleton State University –Central Texas
2005 - 2006	Research assistant. Wallace H. Coulter department of Biomedical Engineering. Georgia Institute of Technology. Atlanta, GA.
1997 - 2005	Graduate Research/Teaching assistant. School of Mathematics. Georgia Institute of Technology, Atlanta, GA.
1995 - 1996	Teaching Assistant. Universidad Nacional Autonoma de Mexico. Mexico City.

Research interests and brief summary of current research projects:

- Dynamical systems: Hamiltonian networks, KAM theory, n-body problems, optimal control.
- Bioinformatics: high-dimensional data classification.

Hamiltonian networks:

The main result of my PhD thesis establishes the existence and linear stability of spatially-localized quasi-periodic solutions (breathers) in a one-dimensional Hamiltonian network of weakly-coupled anharmonic oscillators under a long-range type interaction of fast decay at infinity. This result has important applications in the physical and biological sciences, for example, in the study of the dynamics of a crystal lattice near a dislocation core or in the study of the dynamics of the dislocation core itself. The importance of the study of this type of models resides in that our understanding of them will shed light into the phenomena of focusing and transportation of energy in general biological and physical systems. In my thesis, the existence of breathers is proven via the KAM methodology. My current interest in this area focuses on studying the mechanisms by which breather solutions disappear and how their properties, such as spatial localization, mobility and decay, change in the process of their breakdown as well as the parameter regime outside of which this is expected to occur. In particular, I am interested in the study of large-amplitude or resonant breathers.

Microarray data classification:

In the medical field, the importance of the problems of diagnosis and prognosis of a disease such as cancer and the identification of its biomarkers can never be overemphasized. In dealing with the latter problem the biostatistician must analyze and classify microarray data which comes in the form of vectors in an Euclidean space whose dimension is of the order of thousands. This is a challenging computational problem that has applications in a variety of other fields such as image processing or text categorization (search engines). My current research in this field consists in the developing and testing of classification algorithms for high-dimensional data and in comparing their performance against that of other, more popular, categorization methods such as support-vector machines, kernel methods and Principal Component Analysis, among others. Closely related to this problem are those of the identification of data types for which a particular algorithm will produce optimal classification results, as well as the dependence of the classification error on the algorithm parameters (parameter selection).

Publications

Jiansheng Geng, Jorge Viveros, Yingfei Yi. *Quasi-periodic breathers in Hamiltonian networks with long-range coupling.* 2007 (to appear in Physica D).

A. Olvera, S. Madrid, J. Viveros. *Mapas y projecciones.* Notas de clase, vol 7, no. 17 IIMAS-UNAM, (1998)

Teaching experience:

Tarleton State University –Central Texas

Term	Year	Course code (Math XXX)	Course Name	Responsibility	# Sections
Spring	2008	580	Partial differential equations (graduate)	Lecturer	1
		409	Advanced analysis I	Lecturer	1
		508	Abstract algebra (graduate)	Lecturer	1
		332	Linear algebra	Lecturer	1
Summer	2007	360	Numerical analysis I	Lecturer	1
		303	Concepts of elementary math I	Lecturer	1
		305	Concepts of elementary math II	Lecturer	1
Spring	2007	311	Probability and Statistics	Lecturer	1
		310	Discrete mathematics	Lecturer	1
		305	Concepts of elementary math II	Lecturer	2
Fall	2006	520	Abstract algebra (graduate)	Lecturer	1
		301	Number theory	Lecturer	1
		310	Discrete mathematics	Lecturer	1
		303	Concepts of elementary math I	Lecturer	1

Georgia Institute of Technology:

Term	Year	Course Code (Math XXXX)	Course Name	Responsibility	# Sections
Fall	2005	1502	Calculus II	Teaching assistant	2
Summer	2005	4305	Topics in Linear Algebra	Instructor	2
Spring	2005	1502	Calculus II	Teaching Assistant	2
Fall	2004	1502	Calculus II	Teaching Assistant	2
Summer	2004	2403	Differential Equations	Teaching Assistant	2
Spring	2004	2403	Differential Equations	Instructor	1

Fall	2003	1502	Calculus II	Teaching Assistant	1
Summer	2003	2401	Calculus III	Instructor	1
Spring	2003	2401	Calculus III	Instructor	1
Fall	2002	2401	Calculus III	Teaching Assistant	2
Spring	2002	2401	Calculus III	Teaching Assistant	2
Fall	2001	2403	Differential Equations	Teaching Assistant	2
Fall	2000	2403	Differential Equations	Teaching Assistant	2
Summer	2000	2403	Differential Equations	Teaching Assistant	2
Spring	2000	2403	Differential Equations	Teaching Assistant	2
Fall	1999	1502	Calculus II	Teaching Assistant	2
Spring	1999	2803	Calculus and linear algebra	Instructor	1
Winter	1999	3308	Differential Equations	Teaching Assistant	2
Spring	1998	3308	Differential Equations	Teaching Assistant	2
Winter	1998	3308	Differential Equations	Teaching Assistant	2
Fall	1997	1501	Calculus I	Teaching Assistant	2

Grants:

MINI/SEED grant Tarleton State University-Central Texas, 2008.

Attended conferences and workshops

7th AIMS International Conference on Dynamical Systems, Differential Equations and Applications. May 18-21, 2008. The University of Texas at Arlington.

Georgia Institute of Technology, Atlanta, Georgia. March 22-24, 2008.

2008 Workshop on Sparsity in High Dimensional Statistics and Learning Theory. Georgia Institute of Technology, Atlanta, Georgia. March 22-24, 2008.
International Conference on the Interactions between Wavelets and Splines. The University of Georgia, Athens, Georgia. May 16-19, 2005.

Constructive Functions Tech-04. Georgia Institute of Technology. Atlanta, GA. November 7-9, 2004.

999th AMS Meeting. Vanderbilt University. Nashville, Tennessee. October 16-17, 2004.

Workshop on Hamiltonian Dynamics. Center for Dynamical Systems and Nonlinear Studies. Georgia Institute of Technology. Atlanta, GA. April 5-6, 2003.

AMS and MAA Spring Southeast Section Meetings. Atlanta, GA. Meeting # 975, in conjunction with the Mathematical Association of America. March 8-10, 2002.

Mini symposium on Topics Related to Hilbert's 16th problem. Center for Dynamical Systems and Nonlinear Studies. Georgia Institute of Technology. Atlanta, GA. April 29, 2002.

5th Americas Conference On Differential Equations and Nonlinear Analysis. University of Alberta, Edmonton, Canada. July 7-12, 2002.

Year 2000 International Conference on Dynamical Systems and Differential Equations. Kennesaw State University. May 18-21, 2000.

3rd Americas Conference On Differential Equations And Nonlinear Analysis. Atlanta, GA. September 9-13, 1998.

1st Americas Conference On Differential Equations And Nonlinear Analysis. Taxco, Gro. Mexico. 1996.

AMS/MMS Joint meeting. Guanajuato, Mexico, November 1995.

Seminar talks

A bird's eye view of the vortex problem. Mathematics Department Seminar, Southern Polytechnic State University, Georgia. Nov. 2005.

Selected topics in vortex dynamics. Part I: planar case. Graduate student seminar, GT. March 2002.

Selected topics in vortex dynamics. Part II: spherical case. Graduate student seminar, GT. March 2002.

Aubry-Mather theory in PDEs. Summer colloquium, Department of Computational Science, National University of Singapore. June 2001.

The three vortex problem on the sphere. Summer seminar, Department of Computational Science, National University of Singapore. June 2001.

Early Aubry-Mather theory. Dynamics seminar, CDSNS, Georgia Tech. February 2001.

Computer skills: MATLAB, Octave, Maple, Latex, Word, HTML, Excel, SOffice.

Other academic activities

Teaching assistant for the Regent's prize awarded Teaching Assistant Development Seminar. School of Mathematics, Georgia Tech. Fall 2003.

Mathematics Tutor for the Office of Minority Educational Development at Georgia Tech. 2003-2005.

References

Academic

Dr. Yingfei Yi (academic adviser)
Professor
Georgia Institute of Technology
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Dr. Luca Dieci
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Teaching

Dr. Lloyd Martin
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