Curriculum Vitae
Luis David Garcia–Puente

Department of Mathematics and Statistics
Sam Houston State University
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Date of Birth: 25 July 1976
Birthplace: Mexico City, Mexico
Citizenship: Mexican (U.S. permanent resident)
Race: Hispanic
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Education:

Ph.D. 2004	Virginia Polytechnic Institute and State University, Mathematics Advisor: Reinhard Laubenbacher Dissertation: Algebraic Geometry of Bayesian Networks
B.S. 1999	National University, Mexico, Mathematics Honors thesis in Gröbner bases Minor in Computer Science

Employment:

2007 –	Assistant Professor Sam Houston State University, Huntsville, TX
2005 – 2007	Visiting Assistant Professor Texas A&M University, College Station, TX
Fall 2004	Postdoctoral Research Fellow Mathematical Science Research Institute, Berkeley, CA
Sum. 2004	Postdoctoral Research Fellow Department of Mathematics, University of California, Berkeley, CA
Spr. '03; '04	Graduate Research Assistant Virginia Bioinformatics Institute, Virginia Tech, Blacksburg, VA
Sum. 2000	Graduate Research Fellow Physical Science Laboratory, New Mexico State University, Las Cruces, NM

Research Interests:

Algebraic Statistics, Computational Algebraic Geometry, Combinatorial Commutative Algebra

Awards and Fellowships:

Spring 2009	SAMSI New Researcher fellowship, Statistical and Applied Mathematical Sciences Institute, Research Triangle Park, NC.
Fall 2004	Postdoctoral Fellow, Mathematical Science Research Institute, Berkeley, CA.
Fall 2002	Research Fellow, University of Genova, Italy.
2000	Award team MathQuiz2000. Research level contest organized by the Centre de Reccerca Matemàtica (Barcelona) as part of the celebrations for the World Mathematics Year.

1999 Sotero Prieto Award for the Best Undergraduate Thesis of the Year. Nationwide honor awarded by the Mexican Mathematical Society.

Grants:

Oct. 2007 Advanced Research Program (ARP) 2007. Submitted the proposal "Applications of Algebraic Geometry to Algebraic Statistics and Geometric Modeling" in collaboration with F. Sottile.

Feb. 2006 Internal Texas A&M University Grant in support of the proposal "Mathematical Foundations for Probabilistic Boolean Networks" submitted to the Career Awards at the Scientific Interface program of the Burroughs Wellcome Fund.

Publications:

1. Linear precision for parametric patches (with F. Sottile), Submitted.
2. Computing the additive structure of indecomposable modules over Dedekind-like rings using Gröbner bases (with M. A. Aviño-Diaz), in *Journal of Algebra and Its Applications*, **6/2** (2007) pp. 291-304.
3. Catalog of small trees (with M. Casanellas and S. Sullivant), book chapter in *Algebraic Statistics for Computational Biology*, (L. Pachter and B. Sturmfels Eds.) Cambridge University Press, (2005) pp. 291–304.
4. Sequential dynamical systems over words (with A.S. Jarrah and R. Laubenbacher), in *Applied Mathematics and Computation*, **174/1** (2005) pp. 500-510.
5. Algebraic geometry of Bayesian networks (with M. Stillman and B. Sturmfels), in *Journal of Symbolic Computation*, **39/3–4** (2005) pp. 331–355. Special issue on the occasion of Mega 2003.
6. Algebraic Statistics in model selection, in M. Chickering and J. Halpern, editors, *Proceedings of the* 20^{th} *Conference of Uncertainty in Artificial Intelligence*, (2004) 177–184.
7. Bases de Gröbner asociadas a módulos finitos, in *Miscelánea Matemática (MMS)* **30** (2000), pp. 65–70.

Conference Talks:

2008 Apr. First International Workshop on Algebraic Geometry and Approximation Theory (Towson University, Towson, MD): Linear precision for toric patches.

—— First International Workshop on Algebraic Geometry and Approximation Theory (Towson University, Towson, MD): What is computational algebraic geometry?

Mar. 32nd SIAM Southeastern-Atlantic Section Conference (University of Central Florida, Orlando, FL): Linear precision for toric patches.

2007 Oct. Second Workshop on Constructive Function Theory (Sam Houston State University, Huntsville, TX): Linear precision for toric patches.

	July	Applicable Algebraic Geometry (2007 IMA PI Summer Program for Graduate Students, Texas A&M University, College Station, TX): Bézier curves and surfaces.
	May	Workshop on Non-Linear Computational Geometry (Institute for Mathematics and its Applications, MN): Linear precision for parametric patches (poster).
	Jan.	Joint Mathematics Meetings (New Orleans, LA): Linear precision for parametric patches.
2004	May	Joint AMS–SMM International Meeting (Houston, TX): Algebraic geometry applications in Bayesian model selection.
	Apr.	MSRI workshop on Algorithmic, Combinatorial and Applicable Real Algebraic Geometry (Berkeley, CA): Algebraic geometry applications in model selection.
2003	Dec.	Computational Algebraic Statistics (American Institute of Mathematics, Palo Alto, CA): Independence varieties of Bayesian networks on three observable variables and one hidden variable.
	June	Challenges in Stochastic Computation Closing Workshop (SAMSI, NC): Algebraic geometry of Bayesian networks with hidden variables.
	——	MEGA 2003 (Kaiserslautern, Germany): Algebraic geometry of Bayesian networks.
	Feb.	Grostat VI (Nice, France): Algebraic classification of Bayesian networks.
2002	Aug.	SIAM (San Diego, CA): Classification of finite dynamical systems.
2001	Sept.	SACNAS (Phoenix, AZ): Mathematical foundations for computer simulations.
2000	Oct.	SACNAS (Atlanta, GA): Combinatorial tools for the analysis of decision systems.
1999	June	Summer Conference on Computational Algebra with Applications (U. Wyoming, WY): Computing Gröbner bases associated to finite modules.
	Feb.	Conference on Gröbner bases CIMAT-MSRI (Guanajuato, México): Gröbner bases associated to finite modules.

Colloquia and Seminar Talks:

2007	Aug.	Sam Houston State University Colloquium
	Mar.	Texas A&M University Algebra and Combinatorics Seminar
	Jan.	North Carolina State University Colloquium
	——	Sam Houston State University Colloquium
2006	Nov.	Sam Houston State University Colloquium
	May.	Texas A&M University Algebra and Combinatorics Seminar
2005	Oct.	Texas A&M University Postdoc Seminar
	Mar.	UC Berkeley Algebraic Statistics for Computational Biology Seminar
2004	Dec.	MSRI Postdoc Seminar
	Nov.	Texas A&M University Algebraic Geometry Seminar

	Oct.	Sam Houston State University Colloquium
	Apr.	University of Washington Algebra Seminar
2003	Aug.	Georgia Tech Informal Geometry Seminar
	May	National University Seminario de Algebra (Morelia, Mexico)
	Jan.	UC Berkeley Workshop on Algebraic Statistics
2002	Dec.	University of Cantabria (Santander, Spain)
	Nov.	Politecnico di Torino Algebraic Statistics Seminar (Torino, Italy)
	Aug.	MSRI Combinatorial Commutative Algebra Seminar
	Mar.	Virginia Tech SIAM Graduate Student Seminar
2001	Oct.	University of Bordeaux I (Bordeaux, France)

Teaching Activities:

2008	Fall	Sam Houston State University, Instructor, MTH 142 Calculus I, MTH 163 Plane Trigonometry, and MTH 560 Special Topics(Algorithms for Elementary Algebraic Geometry)
	Sum.	Sam Houston State University, Instructor, MTH 032 Developmental Mathematics II and MTH 163 Plane Trigonometry
	Spr.	Sam Houston State University, Instructor, MTH 164 College Mathematics and MTH 142 Calculus I
2007	Fall	Sam Houston State University, Instructor, MTH 164 College Mathematics and MTH 376 Differential Equations
	Sum.	Texas A&M University, Assistant Instructor, 2007 IMA PI Summer Program for Graduate Students on Applicable Algebraic Geometry
	——	Undergraduate Research in Mathematics at Texas A&M University program, Guest Speaker, Math 662–100, REU/VIGRE course on Algebraic Methods in Bioinformatics
	Spr.	Texas A&M University, Instructor, Math 689 Applicable Algebraic Geometry (with F. Sottile)
2006	Fall	Texas A&M University, Instructor, Math 251 Calculus III
	Sum.	Undergraduate Research in Mathematics at Texas A&M University program, Instructor, Math 662 REU/VIGRE course on Algebraic Methods in Computational Biology (with M. Rojas)
	Spr.	Texas A&M University, Instructor, Math 308 Differential Equations
2005	Fall	Texas A&M University, Instructor, Math 142 Business Calculus II
	Sum.	Undergraduate Research in Mathematics at Texas A&M University program, Instructor, Math 662 REU/VIGRE course on Algebraic Methods in Computational Biology (with M. Rojas and L. Fukshansky)
	Spr.	Texas A&M, Instructor, Math 152 Calculus II

2003 Fall Virginia Tech, Graduate Teaching Assistant, Math 1205 Calculus I

2002 Spr. Virginia Tech, Graduate Teaching Assistant, Math 1205 Calculus I

2001 Sum. Summer Institute in Mathematics for Undergraduates, NSF/REU program, University of Puerto Rico–Humacao, Teaching Assistant, computational algebra course (with R. Laubenbacher and R. Garcia)

1999 – 2000 New Mexico State University, Graduate Teaching Assistant, Intermediate algebra, Precalculus, and Trigonometry

1997 – 1998 National University of Mexico, Undergraduate Teaching Assistant, C++ Programming language, Data Structures, College Algebra, and Linear Algebra

Departmental and University Committee Service:

Member of the MTH 163 – Trigonometry Textbook Committee, Sam Houston State. Spring 2008.

Member of the MS in Mathematics Revision Committee, Sam Houston State. Since Fall 2007.

Member of the Engineering-Technology Committee for the College of Arts and Sciences, Sam Houston State. Since Fall 2007.

Other Departmental Activities:

2007 Spr. Organizer (with F. Sottile) of the Algebra and Combinatorics Seminar, Texas A&M.

2006 Fall Organizer (with F. Sottile) of the Algebra and Combinatorics Seminar, Texas A&M.

2003 Fall Organizer (with R. Laubenbacher) of the seminar on Algebraic Statistics, Virginia Tech.

2002 Fall Organizer (with L. Robbiano) of the seminar on Algebraic Geometry of Graphical Models, University of Genova, Italy.

2002 Spr. Founder of the Graduate Student Seminar sponsored by the SIAM University Chapter at Virginia Tech.

2001 Spr. Organizer (with R. Laubenbacher) of the seminar on Gröbner Bases and Convex Polytopes, New Mexico State University.

Conference Organization:

2008 Apr. Organizer (with T. Sorokina) of the First International Workshop on Algebraic Geometry and Approximation Theory, Towson University.

Advising:

2006 Sum. (with M. Rojas) REU/VIGRE Summer students: Hannah Saugier and Stacey Stokes.

2005 Sum. (with M. Rojas) REU/VIGRE Summer students: Elizabeth Dong, Guangming Lang, and Jacob Porter.

Professional Associations:

American Mathematical Society, Mathematical Association of America, Society for Advancement of Chicanos and Native Americans in Science

Major Journals Refereed:

IEEE Computational Biology, Journal of Algebra, Journal of Symbolic Computation, SIAM Journal of Discrete Mathematics

Other Referee Activities:

Reviewer for Mathematical Reviews since 2007.

Reviewer for Zentralblatt MATH since 2007.
Reviewer for the issue on Nonlinear Computational Geometry of the IMA Volumes in Mathematics and its Applications published by Springer-Verlag.

Reviewer for the Algebraic Biology 2007 Conference Proceedings.

Programming Skills:

Computer Algebra Systems:	CoCoA Macaulay2 Maple Mathematica Sage Singular
Numerical Systems:	Matlab
Programming Languages:	C C++ Perl Python
Web Development:	MySQL PHP HTML CSS
Operating Systems:	Linux OS X

Software:

- Designer and principal developer of the Small Phylogenetic Trees website. This website contains algebraic information of small phylogenetic trees under several models of biological evolution. Maple package to perform all computations is included (with J. Porter).
- Singular library to compute all complex solutions to the critical equations of the maximum likelihood function of a statistical model. Singular is a computer algebra system developed at the University of Kaiserslautern.
- Optimization algorithm for the identification of biochemical network models (with R. Laubenbacher, J. McGee, and P. Vera-Licona).
- Macaulay2 and Singular libraries to compute the independence varieties and primary decomposition of Bayesian networks (with M Stillman). Macaulay2 is a computer algebra system developed by Michael Stillman and Daniel Grayson.
- CoCoA library to compute the primary decomposition of zero dimensional ideals. Implementation for the general case in progress. CoCoA is a computer algebra system developed at the University of Genova, Italy.

- Tulip modules for the biocomplexity research program at NMSU. Tulip is a graph visualization software developed at the University of Bordeaux I.
- C++ program to compute combinatorial homotopy of simplicial complexes (with R. Laubenbacher).

References:

Albert Boggess, Texas A&M University, boggess@math.tamu.edu, (979) 845-9424

Reinhard Laubenbacher, Virginia Bioinformatics Institute, reinhard@vbi.vt.edu, (540) 231-7506

Lorenzo Robbiano, University of Genova, Italy, robbiano@dima.unige.it, +39 (010) 353 6887

Ken Smith, Sam Houston State University, kenwsmith@shsu.edu, (936) 294-3523

Frank Sottile, Texas A&M University, sottile@math.tamu.edu, (979) 845-4169

Bernd Sturmfels, University of California, Berkeley, bernd@math.berkeley.edu, (510) 642-4687