Gustavo Didier

Mathematics Department
Tulane University
6823 St. Charles Avenue
New Orleans, LA 70118

telephone: (504) 862-3426 (office)
http://www.tulane.edu/∼gdidier.htm
e-mail: gdidier@tulane.edu

Research Interests

Probability and stochastic processes (self-similarity, anomalous diffusion), time series analysis (long range dependence), multiscale (wavelets) and multivariate methods, applications in Biophysics and Signal Processing.

Education

2002 - 2007	**University of North Carolina at Chapel Hill**, USA. Ph.D. and M.S. in Statistics. Advisor: Vladas Pipiras.
2000 - 2002	**Institute for Pure and Applied Mathematics**, Brazil. M.S. in Mathematics. Main fields: Probability Theory, Mathematical Economics. Advisor: Aloisio Araujo.
1994 - 2000	**Federal University of Rio de Janeiro**, Brazil. B.A. and M.S. in Economics. Main fields: International Economics, Quantitative Methods. Advisor: Jorge C. Batista.

Professional Experience

2007/7 - present	Assistant professor. Mathematics Department, Tulane University.
2011/1 - 2011/6	Visiting researcher. École Normale Supérieure de Lyon, Physics Lab.
2008/7	Visiting researcher. Institute for Pure and Applied Mathematics, Rio de Janeiro, Brazil.
2004/9 - 2007/6	Research assistant (with Vladas Pipiras). Wavelet methods, Time series analysis and stochastic processes with emphasis on long range dependence, applications. University of North Carolina at Chapel Hill.
2004/6 - 2005/5	Research assistant (with Robert Rodriguez). SAS-IML coding of various statistical techniques. SAS Institute Inc., Cary, NC.
2004/1 - 2004/5	Research assistant (with Harry L. Hurd). Time series analysis for periodically correlated sequences. University of North Carolina at Chapel Hill.
2002/4 - 2002/7	Visiting instructor. Department of Economics, Federal University of Rio de Janeiro.

1997/10 - 1998/3	Research assistant (with J. C. Batista). International Economics. Federal University of Rio de Janeiro.

Publications and accepted papers

[1] "Gaussian stationary processes: discrete approximations, adaptive wavelet decompositions and their convergence", with V. Pipiras. *Journal of Fourier Analysis and Applications*, vol. 14, no. 2, April, pp. 203–234 (2008).

[2] "On the Behrens-Fisher problem: a globally convergent algorithm and a finite sample study of the Wald, LR and LM Tests", with A. Belloni. *Annals of Statistics*, vol. 36, no. 5, pp. 2377–2408 (2008).

[3] "Adaptive wavelet decompositions of stationary time series", with V. Pipiras. *Journal of Time Series Analysis*, vol. 31, issue 3, May, pp. 182–209 (2010).

[4] "Integral representations and properties of operator fractional Brownian motions", with V. Pipiras. *Bernoulli*, **17**(1), pp. 1–33 (2011).

[5] "Exponents, symmetry groups and classification of operator fractional Brownian motions", with V. Pipiras. To appear in *Journal of Theoretical Probability.*

[6] "Statistical challenges in microrheology", with S. McKinley, D. B. Hill and J. Fricks. To appear in *Journal of Time Series Analysis*.

Preprints

[7] "On the wavelet-based simulation of anomalous diffusion", with J. Fricks. Submitted.

[8] "Riesz property of L^2-unbounded transformations of orthogonal wavelet bases", with V. Pipiras.

Working papers

[9] "Wavelet regression for operator fractional Brownian motions", with P. Abry.

[10] "Subdiffusion detection in microrheological experiments", with G. Forest, J. Fricks, D. B. Hill, S. McKinley.

[11] "On multivariate long range dependence".

[12] "Multivariate Adaptive Wavelet Decompositions", with V. Pipiras.

Other publications

[13] "Studies in Stochastic Processes: Adaptive Wavelet Decompositions and Operator Fractional Brownian Motions". *Ph.D. thesis, University of North Carolina at Chapel Hill.* Advisor: V. Pipiras. (2007).

[14] "Real and effective exchange rates with double-weighing scheme for Brazilian manufactured products", with J. C. Batista. *Boletim de Conjuntura*, vol. 20, no. 3, p. 59–66. Rio de Janeiro, Brazil (2001).

[15] "The geography of Brazilian competition patterns and the effects of changes in relative prices on Brazilian exports". *M.S. thesis, Federal University of Rio de Janeiro.* Advisor: J. C. Batista. (2000).

Presentations

2011/10	"On the simulation of anomalous diffusion". Sandia National Labs, Albuquerque, NM.
2011/9	"Self-similarity and long range dependence: some recent developments for the multivariate setting". Penn State Department of Statistics colloquium, University Park, PA.
2011/7	"On the simulation of anomalous diffusion". 7$^{\text{th}}$ International Congress on Industrial and Applied Mathematics, Vancouver, Canada.
2011/6	"Self-similarity and long range dependence: some recent developments for the multivariate setting". 35$^{\text{th}}$ Stochastic Processes and their Applications, Oaxaca, Mexico.
2011/1	"Self-similarity and long range dependence: some recent developments for the multivariate setting". Joint Mathematics Meetings, New Orleans-LA, USA.
2010/11	"Subdiffusions in microrheological experiments", with J. Fricks. LSU Biostatistics Seminar, New Orleans-LA, USA.
2010/10	"Self-similarity and long range dependence: some recent developments for the multivariate setting". Joint Mathematics and Statistics Seminar, Iowa State University, Ames-IA, USA.
2010/8	"Exponents and symmetry groups of operator fractional Brownian motions", with V. Pipiras. 73$^{\text{rd}}$ Annual Meeting of the Institute of Mathematical Statistics, Gothenburg, Sweden.
2010/3	"Subdiffusion detection in microrheological experiments", with J. Fricks. ENAR 2010 Spring Meeting, New Orleans-LA, USA.
2010/3	"Exponents and symmetry groups of operator fractional Brownian motions", with V. Pipiras. Seminar on Stochastic Processes 2010, Orlando-FL, USA.

2009/11	"Self-similarity and LRD: some basic connections and recent developments for the multivariate setting". LSU Biostatistics Seminar, New Orleans-LA, USA.
2009/8	"Multivariate long range dependence and operator self-similarity", with V. Pipiras. Joint Statistical Meeting 2009, Washington-DC, USA.
2009/7	"On operator fractional Brownian motions", with V. Pipiras. 33$^{\text{rd}}$ Conference on Stochastic Processes and Their Applications, Berlin, Germany.
2008/8	"On operator fractional Brownian motions", with V. Pipiras. 11$^{\text{th}}$ Meeting of New Researchers in Statistics and Probability. University of Colorado and NCAR, Boulder-CO, USA.
2008/7	"On operator fractional Brownian motions", with V. Pipiras. Stochastic Processes Seminar. Institute for Pure and Applied Mathematics, Rio de Janeiro, Brazil.
2006/8	"Adaptive wavelet decompositions of stationary time series", with V. Pipiras. 69$^{\text{th}}$ Annual Meeting of the Institute of Mathematical Statistics, Rio de Janeiro, Brazil.
2006/6	"Adaptive wavelet decompositions of stationary (Gaussian) processes", with V. Pipiras. Graybill Conference, 2006, Fort Collins-CO, USA.
2005/6	"Gaussian stationary processes: discrete approximations, special wavelet decompositions and simulation", with V. Pipiras. 30$^{\text{th}}$ Conference on Stochastic Processes and their Applications, 2005, Santa Barbara-CA, USA.
2001/8	"Relative prices and Brazilian exporting performance", with J. C. Batista. 9$^{\text{th}}$ Brazilian School of Time Series and Econometrics, 2001, Belo Horizonte, Brazil.

Grants

- (PI) "On Multivariate Long Range Dependence". Louisiana Board of Regents award LEQSF(2008-11)-RD-A-23, Research Competitiveness Subprogram (2008-2011).

Honors and Awards

2006	IMS Laha travel award for the paper "Gaussian stationary processes: discrete approximations, adaptive wavelet decompositions and their convergence", with V. Pipiras.
2006	NSF Travel Funding for the 69$^{\text{th}}$ Annual Meeting of the IMS.

2005	30th Conference on Stochastic Processes and Their Applications travel award.
1998/3 - 2000/2	CAPES (Brazilian federal funding agency) M.S. Fellowship.
1997	Honors Degree, B.A. in Economics.

Teaching Experience

(**U**: undergraduate; **G**: graduate)

- Tulane University: Instructor for *Stochastic Processes* (**G**, Spring 2010, Spring 2012) *Mathematical Statistics* (**G**, Fall 2009, Fall 2010, Fall 2011), *Introduction to Probability Theory* (upper-level **U**, Fall 2010, Fall 2011), *Introduction to Statistical Inference* (upper-level **U**, Spring 2009), *Analysis I [Measure Theory]* (**G**, Fall 2008), *Time Series Analysis* (**G**, Spring 2008), *Statistics for Business and Economics* (**U**, Fall 2007).

- University of North Carolina at Chapel Hill: Instructor for *Basic Statistics* (**U**, Fall 2005, Spring 2006, Fall 2006, Spring 2007).

- Federal University of Rio de Janeiro: Instructor for *Advanced Calculus* (**U**, 2002).

Students mentored

- Senior project: *The Modeling and Analysis of Financial Time Series*. Richard J. Hayes, Fall 2007.
- MS project (jointly with Chad Bhatti): *Value-at-Risk and GARCH Modeling*. Andrea Hebert, Spring 2008.
- Senior project: *Auction Theory*. Matthew Roser, Spring 2010.

Professional Activities

- Referee for *Stochastic Processes and their Applications*, *Bernoulli*, *Electronic Communications in Probability*, *Applied and Computational Harmonic Analysis*, *Journal of Statistical Computation and Simulation*, *Computational Statistics and Data Analysis*, *Journal of Wavelet Theory and Applications*, *Séminaire et Congrès (Société Mathématique de France)*.
- Member of American Statistical Association, Institute of Mathematical Statistics.

Computer Skills

SAS (including IML), Matlab and R.