ERKAN NANE

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EDUCATION

May 2006 : **Ph.D. in Mathematics,** Purdue University, West Lafayette
Advisor : Rodrigo Bañuelos
Thesis title: Iterated Brownian motion: Lifetime Asymptotics and Isoperimetric-type Inequalities

June 2000 : **Masters in Mathematics,** Boğaziçi University, Istanbul, Turkey

June 1998 : **B.S. in Mathematics,** Boğaziçi University, Istanbul, Turkey

PROFESSIONAL EXPERIENCE

2008- : **Assistant Professor**, Department of Mathematics and Statistics, Auburn University

2006-2008 : **Visiting Assistant Professor**(Post-doc), Department of Statistics and Probability, Michigan State University

2000-2006 : **Teaching Assistant** in Department of Mathematics, Purdue University

1998-2000 : **Teaching Assistant** in Department of Mathematics, Boğaziçi University, Istanbul

RESEARCH INTERESTS

- Probability and its applications to harmonic analysis, partial differential equations, spectral theory and geometry.
- Fractional diffusions and iterated processes: path properties, exit times, local times, Hausdorff dimension results, fractional Cauchy problems in bounded domains, and stochastic solutions to partial differential equations.
- Stochastic processes: Iterated Brownian motion, composition of symmetric stable Lévy processes, self-similar processes, Lévy processes, inverse stable subordinator, continuous time random walks and related stochastic processes.

AWARDS

(1) Spring 2011: Jack Brown Endowed Faculty Award, Dept of Mathematics and Statistics, Auburn University.
(2) Michigan State University Travel support, Summer 2007.
(3) Purdue Research Foundation Fellowship, Purdue University, Summer 2004.
(4) NSF research assistant, Purdue University: Summer 2005, Spring 2005, Spring 2003, Fall 2002, Summer 2002.
(5) Dora Aksoy Award of Boğaziçi University, Istanbul, Turkey. Given to the best graduating Master student of the Department of Mathematics, June 2000.

RESEARCH PAPERS: Refereed Journal Publications

(1) *H. Allouba and E. Nane. Interacting time-fractional and Δ^ν PDEs systems via Brownian-time and Inverse-stable-Lévy-time Brownian sheets.* **Stochastics and Dynamics** *(To appear)*
(2) *M.M. Meerschaert, E. Nane and P. Vellaisamy. Transient Anomalous Sub-diffusion on bounded domains.* **Proceedings of the American Mathematical Society.** *(To appear)*
(3) *E. Nane, Y. Xiao and D. Wu. α-Time Fractional Brownian Motion: PDE Connections and Local Times.* **ESAIM: Probability and Statistics.** *(To Appear).*
(4) *E. Nane. Fractional Cauchy problems on bounded domains: survey of recent results, pp: 185-198 In* **Fractional Dynamics and Control.** *D. Baleanu, J.A.T. Machado, A.C.J. Luo (Editors). Springer (2012).*
(5) *A. Kumar, E. Nane and P. Vellaisamy. Time-changed Poisson processes.* **Statistics & Probability Letters. 81** *(2011), 1899-1910.*

(6) *M.M. Meerschaert, E. Nane and P. Vellaisamy. The fractional Poisson process and the inverse stable subordinator.* **Electronic Journal of Probability** *Vol. 16 (2011), no. 59, 1600-1620.*

(7) *M.M. Meerschaert, E. Nane and P. Vellaisamy. Distributed-order fractional diffusions on bounded domains.* **Journal of Mathematical Analysis and Applications.** *379 (2011) 216–228.*

(8) *E. Nane, Y. Xiao and A. Zeleke. A strong law of large numbers with applications to self-similar stable processes* **Acta Scientiarum Mathematicarum (Szeged)** *76:3-4 (2010), 697-711.*

(9) *E. Nane. Stochastic solutions of a class of higher order Cauchy problems in* $\mathbb{R}^d$. **Stochastics and Dynamics**, *Volume: 10, Issue: 3 (2010) , 341-366.*

(10) *B. Baeumer, M.M. Meerschaert and E. Nane. Space-time duality for fractional diffusion.* **Journal of Applied Probability,** *Volume 46, Number 4 (2009), 1100-1115.*

(11) *E. Nane. Laws of the iterated logarithm for a class of iterated processes,* **Statistics & Probability Letters. vol. 79** *(2009), 1744-1751.*

(12) *M.M. Meerschaert, E. Nane and P. Vellaisamy. Fractional Cauchy problems on bounded domains.* **The Annals of Probability. vol. 37** *(2009), 979-1007.*

(13) *M.M. Meerschaert, E. Nane and Y. Xiao. Correlated continuous time random walks.* **Statistics & Probability Letters. vol. 79** *(2009), 1194-1202.*

(14) *B. Baeumer, M.M. Meerschaert and E. Nane. Brownian subordinators and fractional Cauchy problems.* **Transactions of American Mathematical Society. vol. 361** *(2009), 3915-3930.*

(15) *E. Nane. Isoperimetric-type inequalities for iterated Brownian motion in* $\mathbb{R}^n$, **Statistics & Probability Letters. vol. 78** *(2008), 90-95.*

(16) *E. Nane. Higher order PDE's and iterated processes,* **Transactions of American Mathematical Society. vol. 360** *(2008), 2681-2692.*

(17) *E. Nane. Symmetric* α*-stable subordinators and Cauchy problems:* **IJPAM (International Journal of Pure and Applied Mathematics). vol. 42** *no.2 (2008), 217-225.*

(18) *M.M. Meerschaert, E. Nane and Y. Xiao. Large deviations for local time fractional Brownian motion and applications.* **Journal of Mathematical Analysis and Applications. vol. 346** *(2008), 432-445.*

(19) *E. Nane. Lifetime asymptotics of iterated Brownian motion in* $\mathbb{R}^n$, **ESAIM: Probability and Statistics. vol. 11** *(2007), 147–160 (electronic).*

(20) *E. Nane. Laws of the iterated logarithm for* α*-time Brownian motion,* **Electronic Journal of Probability. vol. 11** *(2006), no. 18, 434–459 (electronic).*

(21) *E. Nane. Iterated Brownian motion in bounded domains in* $\mathbb{R}^n$, **Stochastic Process and their Applications. vol. 116** *(2006), no. 6, 905–916.*

(22) *E. Nane. Iterated Brownian motion in parabola-shaped domains,* **Potential Analysis. vol. 24** *(2006), no. 2, 105–123.*

RESEARCH PAPERS: Preprints

(1) *Jebessa B. Mijena and E. Nane. Strong analytic solutions of fractional Cauchy problems.* **Submitted.** *Arxiv: http://arxiv.org/abs/1110.4158*

(2) *Zhen-Qing Chen, M.M. Meerschaert and E. Nane. Space-time fractional diffusion on bounded domains.* **Submitted.** *Arxiv: http://arxiv.org/abs/1109.2881*

(3) *M.M. Meerschaert, E. Nane and Y. Xiao. Fractal dimensions for continuous time random walk limits.* **Submitted.** *Arxiv: http://arxiv.org/abs/1102.0444*

Discoveries

(1) *Member Discoveries: Fractional Cauchy Problems.(page 5 at Url:http://bulletin.imstat.org/pdf/38/6)* **IMS bulletin paper on our paper "Fractional Cauchy problems on bounded domains: (Joint with M.M. Meerschaert and P. Vellaisamy), The Annals of Probability vol. 37 (2009), 979-1007."** *By Mark M. Meerschaert.*

COURSES TAUGHT

- **Auburn University**
  - **Fall 2011:** Statistics for Engineers and Scientists (Stat 3010), Probability and Stochastic Processes I (MATH 5/6670).

- **Summer 2011:** Experimental Statistics I (Stat 7000)
- **Spring 2011:** Probability II (Math 7810), Applied Time-Series Analysis (Stat 4630)
- **Fall 2010:** Probability I (Math 7800), Statistics for Engineers and Scientists (Stat 3010)
- **Summer 2010:** Statistics for Engineers and Scientists (Stat 3010)
- **Spring 2010:** Probability and Statistics I (STAT 3600), Topics in Linear Algebra (Math 2660)
- **Fall 2009:** Probability and Statistics I (STAT 3600), Topics in Linear Algebra (Math 2660).
- **Spring 2009:** Probability and Statistics I (STAT 3600), Probability and Stochastic Processes II (MATH 5/6680).
- **Fall 2008:** Probability and Statistics I (STAT 3600).

- **Michigan State University** (2006-2008) :
  - Probability and Statistics for Engineering (STT351)(Fall 06, Spring 07, Summer 07): Calculus based statistics course
  - Statistics I (STT421) (Spring 07, Summer 07, Fall 07): Statistics course without Calculus
  - Introduction to Probability and Statistics (STT430) (Summer 08)
  - Probability and Statistics I: Probability (STT441) (Fall 06, Spring 07, Spring 2008)
  - Theory of Probability and Statistics I (STT861) (Fall 07): Graduate level Probability course
- **Purdue University** (2000-2006) :
  - Algebra and Trigonometry (MA 153)(Fall 05): Basic algebra and trigonometry for freshmen.
  - Real Analysis (MA 598R), (Summer 03): Qualifier preparation course for graduate students.
- **Other** : Developed and taught Mathcounts and Olympiad preparation courses for middle and high school students for Purdue University Math and Science Initiative (2004-2005)

COURSES ASSISTED(as TA/Grader)

- **Undergraduate Courses:** Calculus (I, II, III), Linear Algebra, Functional Anlaysis, Real Analysis
- **Graduate Courses:** Real-Complex Analysis, Linear Algebra, Advanced Topics in Analysis

TALKS

(1) *Continuous Time Random Walk Limits: Governing Equations and Fractal Dimensions.* Colloquium, Department of Mathematical Sciences, University of Alabama at Huntsville (Nov 2011).
(2) *Time-changed processes and Cauchy problems.* Colloquium, Department of Mathematics, University of Alabama at Birmingham, AL. (September 2011).
(3) *Fractional Cauchy Problems for time-changed Processes.* Tufts University Probability Seminar, Boston, MA (February 2011).
(4) *Cauchy Problems Solved by Running Subordinate Processes.* Informs 2010 Annual Meeting. Austin, Texas (November 7-10, 2010).
(5) *Cauchy Problems in Bounded Domains and Iterated Processes.* EMS2010, 28th European Meeting of Statisticians. EMS 2010, Piraeus, Greece, University of Piraeus (August 2010).
(6) *Fractional Cauchy problems on bounded domains: survey of recent results.* Third Conference on Nonlinear Science and Complexity. Ankara, Turkey, ankaya University (July 2010).
(7) *Stochastic solution of Cauchy problems.* Graduate student seminar, Department of Mathematics and Statistics, Auburn University, October 2009.
(8) *Publish and Flourish.* Second Annual Workshop for Young Scholars, Southern Polytechnic State University, Georgia, August 2009.
(9) Fractional Cauchy problems. Gaussian Analysis & SPDEs, AMS southeastern sectional meeting. University of Alabama in Huntsville, October 2008.
(10) *Subordinated processes and Cauchy problems.* Malliavin Calculus & Appl. Regional CBMS/NSF conference, Kent State University, OHIO, August 6-12, 2008.
(11) *Subordinated processes and Cauchy problems.* Probability Seminar, Department of mathematics, University of Illinois, Urbana-Champaign, April 2008.
(12) *Iterated Brownian motion and a related class of processes.* Department of Mathematics Colloquium, University of Oregon, Eugene, Oregon, February 2008.

(13) *Iterated Brownian motion and a related class of processes.* Department of Mathematics Colloquium, Auburn University, Alabama, February 2008.
(14) *Iterated Brownian motion and a related class of processes.* Department of Mathematics and Statistics Colloquium, American University, Washington, DC, February 2008.
(15) *Iterated Brownian motion and a related class of processes.* Statistics Colloquium, Department of Statistics and Operations Research, University of North Carolina, Chapel Hill, January 2008.
(16) *Symmetric α-stable subordinators and Cauchy problems.* Fourth International Conference of Applied Mathematics and Computing, (Plovdiv, Bulgaria, August 12 - 18, 2007) (30-min lecture)
(17) *Symmetric α-stable subordinators and Cauchy problems.* Department of Statistics and Probability Seminar, Michigan State University, March 2007. (two-hour lecture)
(18) *Iterated Brownian motion: lifetime asymptotics and isoperimetric-type inequalities.* Department of Statistics and Probability Colloquium, Michigan State University, September 2006.
(19) *Iterated Brownian motion in open sets in $\mathbb{R}^n$.* Probability seminar, Department of Mathematics, Purdue University, October 2004.

MEETINGS ATTENDED

(1) Twenty-Ninth Midwest Probability Colloquium, Northwestern University, October 2007
(2) AMS Regional Meeting, at Bloomington, IN, April 2003

EDITORIAL SERVICE

Member of Editorial Advisory Board: An International Journal of Optimization and Control: Theories and Applications(IJOCTA). URL: http://www.ijocta.com/ojs/index.php/files

REFEREE/REVIEWER

- Mathematical Reviews
- Bernoulli
- Journal of Functional Analysis
- Journal of Mathematical Analysis and Applications
- Statistics & Probability Letters
- Journal of the Franklin Institute
- Electronic Journal of Probability
- Journal of Theoretical Probability
- Journal of Physics A: Mathematical and Theoretical
- Journal of Statistical Physics
- Mathematical Methods in the Applied Sciences
- Inverse Problems
- An International Journal of Optimization and Control: Theories and Applications(IJOCTA).
- EuroPhysics Letters
- Applicable Analysis
- Applied Mathematics and Computation
- Arab Journal of Mathematical Sciences

THESIS COMMITTEES

- Jebessa Mijena, Ph.D. Candidate, Auburn University (Major professor).
- Xin He, Ph.D. Candidate, Auburn University (Committee member).
- Kei Kobayashi, Ph.D., Tufts University (Outside committee member). Defended on February, 2011.
- Seth Kermouser, M.S.,Auburn University (Committee member). Defended on June 2010.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Mathematical Society (AMS), Institute of Mathematical Statistics (IMS)

EXTRA CURRICULAR ACTIVITIES

- I volunteered to supervise the "Trajectory" competition in the 2009 and 2010 Science Olympiad.
- I volunteered to supervise the "Storm the Castle" competition in the 2011 Science Olympiad.

COMPUTER SKILLS

- Programming Languages : Pascal
- Technical Software Packages: Minitab, Maple, Mathlab, "R", SAS.