

## Ionut Florescu

Assistant Professor of Mathematics  
Department of Mathematical Sciences  
Stevens Institute of Technology  
Castle Point on the Hudson  
Hoboken, NJ 07030, USA  
ifloresc@stevens.edu (201) 216 5452

### EDUCATION

**Doctor of Philosophy** in Statistics, Purdue University, West Lafayette, Indiana, USA  
December 2004. *Primary Research Area:* Mathematics of Finance

**Master of Science** in Statistics with specialization in Computational Finance Purdue University,  
West Lafayette, Indiana, USA; December 2001

**Master of Science** in Mathematics with specialization in Stochastic Processes University of Bucharest,  
Romania; July 1997

### HONORS, AWARDS

- *Real-time tracking of positions of non-rigid objects in images having changing background*, with Rustam Stolkin, patent pending, 2008, Ref.number: 101995.020900
- Contributor to *Polymorphic track mechanism for a manned or unmanned all-terrain vehicle* patent pending.
- I.W. Burr award for academic excellence and quality of the thesis research, May 2005.
- Purdue Research Foundation Grant, Purdue University, August 2003 - December 2004
- Puskas Memorial Fellowship for the Academic Year 2002-2003, Purdue University
- Merit Scholarship, 1991-1997, University of Bucharest, Romania

### PREVIOUS AND PRESENT POSITIONS

**Stevens Institute of Technology, Department of Mathematical Sciences, U.S.A.**  
*Assistant Professor (tenure track)* Fall 2005 - present

**Purdue University, Department of Statistics, U.S.A.**  
*Visiting Assistant Professor*, Spring 2005  
*Teaching Assistant*, Fall 1998 - Fall 2004

**Romanian Academy, Center for Mathematical Statistics, Bucharest, Romania**  
*Research Assistant*, Fall 1997-Spring 1998

**University of Bucharest, Department of Physics, Romania**  
*Lecturer*, Fall 1997 - Spring 1998

### RESEARCH INTERESTS

#### Probability Theory and Stochastic Analysis

Stochastic Volatility  
Stochastic PDE's  
Numerical Methods for Stochastic Processes  
Nonlinear Stochastic particle filtering  
Monte Carlo Methods  
Tree approximations for Diffusion Processes  
High frequency data analysis

#### Applications to other fields

The Diffie-Hellman Decision Problem  
Computer Vision Tracking  
Clustering  
Acoustic sensors - detection problem  
Optimal sensor placement and tracking  
Robotics

### PUBLICATIONS

### Refereed publications.

1. I. Florescu and C. G. Păsărică, “A study about the existence of leverage effect in Stochastic Volatility models”, *Physica A*, 2008, (in print)
2. C. Ulibarri, P. Anselmo, K. Hovespian and I. Florescu “Noise-Trader Risk” And Bayesian Market Making In FX Derivatives: Rolling Loaded Dice?, *International Journal of Finance and Economics*, 2008 (in print)
3. R. Stolkin, I. Florescu, Probability of detection and optimal sensor placement for threshold based detection systems, *IEEE Sensors*, 2008 (in print)
4. I. Florescu A summary of recent and old results on the security of the Diffie-Hellman key exchange protocol in finite groups, book chapter in Ed/s S. Lian and Y. Zhang, *Handbook of Research on Secure Multimedia Distribution*, IGI Global, 2008 (in print)
5. I. Florescu and F. Viens, Stochastic volatility: option pricing using a multinomial recombining tree, *Applied Mathematical Finance*, vol. 15, no. 2, April 2008, 151-181.
6. R. Stolkin, I. Florescu, M. Baron, C. Harrier and B. Kocharov: Efficient visual servoing with the ABCshift tracking algorithm, *Proceedings of the 2008 IEEE International Conference on Robotics and Automation*, Pasadena, CA, May 2008
7. R. Stolkin, I. Florescu: Probabilistic analysis of a passive acoustic diver detection system for optimal sensor placement and extensions to localization and tracking, *Proc. IEEE MTS OCEANS 2007*.
8. R. Stolkin, I. Florescu, G. Kamberov: An adaptive background model for CAMSHIFT tracking with a moving camera, *Advances In Pattern Recognition*, Proceedings of the Sixth International Conference Indian Statistical Institute, Kolkata, India 2-4 January 2007
9. I. Florescu and F. Viens, Sharp estimation for the almost-sure Lyapunov exponent of the Anderson model in continuous space. *Probability Theory and Related Fields*, vol. 135, no. 4, Aug 2006, pages 603-644.
10. I. Florescu and F. Viens, A Binomial Tree Approach to Stochastic Volatility Driven Model of the Stock Price. *Annals of the University of Craiova, Mathematics and Computer Science Series*, **32** (2005), p. 126-142.

### Non-refereed publications.

Florescu I. “Pricing using Implied Volatility Surface”, technical report, Purdue University, TR05-02

Florescu I. “Queuing Processes - An introduction with Proposed Applications to Finance”, technical report, Purdue University, TR05-01

“Real-time vision guided robotic systems”, poster presentation at Research and Entrepreneurship day at Stevens, April 30, 2008.

### Papers currently in review.

“A comparison of two discrete time stochastic volatility models”, *in review*

“Statistical approach to the Decision Diffie-Hellman Problem using entropy”, with A. Myasnikov and A. Mahalanobis *in review*

“A Sexually Transmitted Fatal Condition: the Odds of Existing and Family Counseling for Inherited Disease”, with J. Bach *in review*

“Clustering/Stepwise selection procedure in Finance”, with A. Myasnikov *in review*

## Work in progress

Segmentation of an object starting with a simple point (Click!), with D. Bozdog and R. Stolkin  
 Coefficient estimation for discretely observable Stochastic systems, with K. Khashanah and X. Lin

Combining sensor information to probabilistically track underwater threats, with R. Stolkin  
 “A study of scaling and convergence of Projection Pursuit algorithms”, with A. Molyboha and A. Myasnikov

## TEACHING EXPERIENCE

### Undergraduate Courses:

Probability and Statistics for engineers, Elementary Probability, Statistics for Liberal Arts students, Intermediate Statistics, Differential Equations.

### Graduate Courses:

Probability Theory, Stochastic Processes, Mathematical Statistics, Real Analysis, Pricing and Hedging, Computational Methods in Finance, Portfolio Theory and Investments, Time series.

### Curriculum Development:

New course content: *Intermediate Statistics*, introduced the use of R statistical software throughout the course, the study of advanced statistical methods such as multivariate regression, diagnostic checks, Two-way ANOVA, ANCOVA and logistic regression.

New course content: *Computational Methods in Finance*, structured the class and introduced advanced topics such as tree processes for approximating continuous time stochastic volatility models, Fast-Fourier transform applied to finance and in particular to the variance gamma process.

New course content: *Stochastic Processes*, introduced the study of Brownian motion and derivatives, and wrote a series of 100 page original lecture notes for the class.

New course: *Time Series*, an entirely new course, studying the classical time series models and the recent heteroschedastic models applied to Finance.

## INVITED CONFERENCE TALKS

*9ème Colloque Franco-Roumain de Mathématiques Appliquées*, Universitatea Transilvania, Brasov, Romania, “A clustering/selection method to capture the systematic movement of equity’s return”, Aug. 28- Sept. 2, 2008.

*2007 Fall Western Section Meeting* AMS sectional meeting, University of New Mexico, “Stochastic Volatility models: Leverage effect in continuous time”, October 13-14 2007.

*Stochastic Processes and their Applications SPA 07(32nd edition)*, University of Illinois at Urbana-Champaign, “Analyzing discrete time stochastic volatility models”, August 6–10, 2007

*Kent-Purdue Mini-symposium on Financial Mathematics (3rd edition)*, Kent University, “Estimating parameters for Diffusion Equations with a hidden factor”, April 27–28, 2007

*American Mathematical Society sectional meeting*, Stevens Institute of Technology April 14–15, 2007

*Fourth Rutgers Stevens Workshop on Optimization of Stochastic Systems*, Stevens Institute of Technology “Statistical methods in cryptography. An application to the Diffie-Hellman exchange protocol”, March 30–31, 2007

*2006 International Workshop on Applied Probability*, University of Connecticut, USA, “Coefficient Estimation for Stochastic Volatility Models”, May 15–18, 2006

*Third Rutgers-Stevens Workshop on Optimization of Stochastic Systems*, Rutgers University, USA, “Option Pricing Using Recombining Trees”, Sep 30–Oct 1, 2005

*Le 7<sup>e</sup> Colloque Franco-Roumain de Mathématique Appliquées*, Craiova, Romania, “A Binomial Tree Approach to Stochastic Volatility Driven Model of the Stock Price”, Aug 30–Sep 3, 2004

*Summer School in Probability*, Saint-Flour, France, "Pricing using Implied Volatility Function", 2003

*Summer School in Mathematics of Finance*, Cortona, Italy, "Equilibrium Prices in Incomplete Markets", 1997

## INVITED SEMINAR LECTURES

Mew Mexico State University, , November 6, 2008

CUNY Graduate Center, Applied Mathematics Seminar, , October 17, 2008

Stevens Institute, Mathematical Sciences Colloquium, *A Clustering/Selection method to capture the systematic movement of Equity's Return*, May 6 2008

Rutgers University, Mathematical Finance and Probability Seminars, *A Clustering/Selection method to capture the systematic movement of Equity's Return*, April 15 2008

CUNY Graduate Center, Algebra and Cryptography Seminar, *Looking at the Diffie-Hellman key exchange protocol from a statistical perspective*, February 29, 2008

University of Cincinnati *Statistical methods in Cryptography. An application of relative entropy and permutation testing to asses the security of the Diffie-Hellman exchange protocol.*, November 6, 2007

Stevens Society of Mathematicians (SSM) *Stochastic Calculus: Application to calculating Leverage effect in Stochastic Volatility models*, September 19, 2007.

Kent University *Option pricing for stochastic volatility models using a highly recombining tree*, April 23, 2007

Bloomberg seminar series, *Option pricing under a stochastic volatility model, using a stochastic, highly recombining tree.*, March 15, 2007

Stevens Institute, *Mini-Lecture Series in Stochastic Integration*, Sep 20 – Oct 20, 2006

Stevens Institute, Computer Science- Security Seminar, *Statistical approach to the Decision Diffie-Hellman Problem*, Oct 2, 2006.

Purdue University, Computational Finance Seminar, *Coefficient Estimation for Diffusion Models*, Apr 28, 2006

Stevens Institute of Technology, Nonlinear Systems Seminar, *Sharp estimation of the almost-sure Lyapunov exponent for the Anderson model in continuous space*, Oct 4, 2005

Stevens Institute of Technology, Stochastic Systems Seminar, *Stochastic Volatility Stock Price - Option Pricing and Coefficient Estimation*, Feb 18 2005

Purdue University, Probability Seminar, *A Lower Bound for the Exponential Behavior of the Solution to the Anderson Stochastic Parabolic Equation*, Jan 18, 2005.

Purdue University, Computational Finance Seminar *A Binomial Tree Approach to Stochastic Volatility Driven Model of the Stock Price*, Apr 23, 2004

Purdue University, Probability Seminar, *Tree Approximation to the Option Price in the Stochastic Volatility World*, Sep 28, 2004

## PROFESSIONAL ACTIVITIES AND AFFILIATIONS

Attended Summer School in Probability, *Saint-Flour*, France, 2003

Attended Summer School in Mathematics of Finance, *Cortona*, Italy, 1997

Co-author of the Option Calculator Program "K-Option," <http://koptioncalc.sourceforge.net/>

IMS (Institute of Mathematical Statistics) , Member

ASA (American Statistical Association), Member

**OTHER PROFESSIONAL ACTIVITIES****Reviewer of manuscripts for the following Journals:**

Annals of Finance, IEEE transactions in Pattern Analysis and Machine Intelligence (TPAMI),  
Mathematical Reviews, RISK, Decisions in Economics and Finance.

Springer (book reviews).

**Conference and Seminar Organizer**

Stevens Institute of Technology *Financial Engineering Seminar*, Spring 2007 -

Stevens Institute of Technology *Stochastics Systems Seminar*, Fall 2005 -

Section Chair, *JSM 2005*, Section on Nonparametric Statistics, Aug 7-11, 2005

**OUTREACH AND SERVICE**

Member of the academic appeals committee, undergraduate curriculum committee and the library committee at Stevens Institute of Technology.

Submitted an accepted internal proposal and worked with undergraduate students during the summer of 2007 as part of the Technogenesis project at Stevens Institute of Technology.

Webmaster for the Mathematical Sciences Department, the Financial Engineering program and the Stochastic Systems program at Stevens Institute of Technology.

**STUDENTS AND STUDENTS ADVISING**

Ph.D. major advisor: Dragoş Bozdog (anticipated 2011), Forrest Levin (anticipated 2010)

Undergraduate students working on senior design project: Morgan Baron, Kirk Deligiannis, Colin Harrier, Matt Hochberger working on "Design of a Vision Guided Robotic Vehicle", AY 2007-2008, co-advising with G. Kamberov and R. Stolkin. (won the award for the best senior design project at Stevens 2008)

Graduate committee member: Ludmyla Reveda (Ph.D. 2005), Thomas Surowiec (Masters' 2006), Gregory Stock (Masters' 2007).