Curriculum Vitae

Kandethody M. Ramachandran

5059 Southampton Circle
Tampa, FL 33647.

Department of Mathematics and Statistics
University of South Florida
Tampa, FL 33620-5700.
Ph. (813)974-1270.

E-mail: ram@usf.edu

EDUCATION

Ph.D., Applied Mathematics, 1988.
Brown University, Providence, Rhode Island
Thesis Title: *Nearly Optimal Singular Controls for Wide band Noise Driven Systems and Queueing Processes*.
Thesis Advisor: Professor Harold J. Kushner.

M.Sc., Mathematics, 1979
B.Sc., Mathematics, 1977
Calicut University, Calicut, India.

EMPLOYMENT

Full Professor, Department of Mathematics, University of South Florida, Tampa, FL 33620-5700. 1999 - Present

Associate Professor, Department of Mathematics, University of South Florida, Tampa, FL 33620-5700. 1993 - 1999.

Assistant Professor, Department of Mathematics, University of South Florida, Tampa, FL 33620-5700. 1987 - 1993.

TEACHING EXPERIENCE
Awards

Reciepient, 1995 - 96 TIP award (Teaching Incentive Program, University of South Florida) .

Taught following Math/Stat courses at U.S.F

Undergraduate:
Engineering Calculus I & II & III ; Regular Calculus I, II, & III;
Elementary Calculus I; College Algebra; Algebra/Trigonometry;

Introduction to Statistics; Introduction to Probability; Essentials of Statistics; Advanced Essentials of Statistics, Differential Equations, Stochastic Processes

Graduate:
Probability Theory I & II; Stochastic Processes; Mathematical Statistics
Time series; Linear Models; Non-Parametric Statistics; Bayesian Statistics; Multivariate Analysis.

Conference and workshops conducted:
STEM Workshop 2**,** Organised a workshop for faculty to disseminate results and strategies of USF-STEP grant to other colleges and universities in Florida, April 5, 2014.
STEM Workshop**,** Organised a workshop for faculty to disseminate results and strategies of USF-STEP grant to other colleges and universities in Florida, September 29, 2012.

Calculus Reform Conference, Organized and attended along with five other professors of Mathematics Department, University of South Florida, Tampa, Florida, April 9 and April 23, 1994.

Workshops attended
▪ *Transforming Passive Listeners into Creative Thinkers in USF's Liberal Arts Program*, organized by Center for Teaching Enhancement, University of South Florida, Tampa, Florida, June 24 -28, 1996.

▪ *Creating a Teaching Portfolio Workshop*, organized by Center for Teaching Enhancement, University of South Florida, Tampa, Florida, July 21, 1995.

▪ *Involving Students: Using Active Learning Strategies in University Classes,* organized by Center for Teaching Enhancement, University of South Florida, Tampa, Florida, July 20-July 31, 1992.

ADMINISTRATIVE EXPERIENCE

▪ Associate Director, Statistics Program, USF, 2010-2015

▪ Director of Admissions for the Graduate Program in Statistics 2003-2015

▪ Chair, Statistics faculty advisory committee, 2010-2017,

▪ Director of Admissions for the Graduate Program in Mathematics,
 Fall 1995 - Fall 1997.

▪Chair, Statistics Faculty Search Committee, 2013-2014.

▪ Chair, Statistics Faculty Search Committee (Assistant & full professor searches), 2006-2007.

▪ Chair, Statistics Faculty Search Committee, 2003-2004.

. Served on various faculty search committees

. Served on various departmental committees, sometimes as chair.

. Served on SNSM faculty search committee, 2012-13.

. Served in CAS and SNMS T&P committees, 2011-13.

. Global Organizing Committee Member, The Fourth World Congress of Nonlinear Analysts, Orlando, June 30-July 7, 2004.

GRANTS AWARDED

External Grants

A total of $3,409,754 of external funds have been received as PI or co-PI. A listing of all the grants received follows:

2014-2019, ***Howard Hughes medical Institute, (HHMI),*** *An Integrated Evidence-Based Introductory Level Biology Curriculum to Inspire the Success and Persistence of Future STEM Scientists,* ***KEY Faculty (same as CO-PI), "Sustaining Excellence" Program, Funded amount $1,200,000*** *(PI: Richard Pollenz, other co-PIs:* Co-Pis, Scott Lewis, Bob Potter, Kevin Yee*).Dates: September 1, 2014- August 31, 2019.*

♦ 2008-2014, A STEP to grow in Science-Engineering-Mathematics Undergraduate degrees, *PI*, **Funded amount $1,999,754.** [Award Date: June 11, 2008; Award No. DUE-0756847, Proposal No. DUE-0756847, CO-PIs: Catherine A Beneteau (Math), Sott W Campbell (Chemical Eng.), Arcadii Z Grinshpan (Math), Gordon Fox (Biology)].

♦ 2004-2007, Economic Reliability of Deregulated Power Markets: A Machine Learning Model for Design and Assessment, *Co-PI*, NSF Control, Networks, and Computational Int, **Funded amount $ 210,000** (PI: Tapas Das (industrial engineering), other CO-Pis: L. A. Martin-Vega (industrial engineering), R. E. Fehr (electrical engineering) [Award **0400268** was made on **03/24/04** for **$ 210,000.00** with an effective date of **05/01/04**. Award Duration: **36** (months).

Internal Grants

◆ 1996-97, Faculty International Travel award, **Funded $1500** for travel to Waterloo, Canada.

◆ 1995-96, Faculty International Travel award, **Funded $1500** for travel to Greece. (Account Number 7903-902-R0)

◆ 1993-94, Title: Calculus Reform Conference, proposal submited (with K. Pothoven, K. Negle, F. Zerla, Clark, and Manugian) to USF Conference grant program, **Funded $3,000**. Also generated $4000 from external sources.

♦ 1999, Member of the digitat video center that got funding from Provost, USF.

U.S. PATENTS

1. "**System for multiresolution analysis assisted reinforcement learning approach to run-by-run control** " **(with Rajesh** Ganesan and Tapas K. Das, 2005, U.S. Patent #60/707,243. Provisional Patent # USF Ref. No. 05B075. United States Patent 7672739 B2, 03/02/2010.

EDITORIAL

Member, Editorial Board, International Journal of Mathematical Sciences for Business and Finance(IJMSBF), IFNA Publishers, USA, **http://www.ifnaworld.org/ojs/index.php/IJMSBF/index.**

Editorial Committee Member, Proceedings of Dynamic Systems and Applications, Vol 7, 2016.
Editorial Committee Member, Proceedings of Neural, Parallel, and Scientific Computations, Vol. 4, August 2010.

PANEL REVIEWER

Invited reviewer of 4 proposals for Department of Homeland Security (DHS) CHSQA, 2017.
Invited reviewer of 6 proposals for Department of Homeland Security (DHS) CBTIR Focused Area 2016

Invited reviewer and panelist for National Science Foundation, STEP (Science, Technology, Engineering and Mathematics) program, 2008-2009.

BOARD OF DIRECTORS

Member, Board of Directors of International Federation of Nonlinear Analists (IFNA); 2010- current.

Exicutive Director (elected)

Interdisciplinary Data Sciences Consortium (*IDSC*), Fall 2014-present.
(Founding director)

RESEARCH EXPERIENCE

.1987 - current, University of South Florida.

Published papers on: Applications of statistics to software rliability, Game theory application to deregulated electricity markets (NSF funded), Microarray data analysis, Mathematical Finance, Control of Queues in Heavy Traffic, Stochastic Delay Differential Equations and Controls, Stochastic Differential Games,

Information Theory, Singularly Perturbed Stochastic Systems, and wavelet analysis for statistical signal processing.

▪1984 - 1987, Brown University.

Analysis of Singular Control Problems for Wide band Noise Driven Systems using weak convergence methods. Analysis of nearly optimal control for queues in heavy traffic.

▪1979 - 1984, Tata Institute of Fundamental Research. India.

Machine Learning processes and its asymptotic analysis. Martingale and variational methods for stochastic control.

Wrote Lecture Notes: Stochastic Control and Nonlinear Filtering, for M.H.A. Davis, published in Tata Institute Lecture Notes Series, Springer-Verlag, 1984.

Wrote unpublished Lecture Notes: Singular Stochastic Control, for A. Bensoussan.

Director of Doctoral students/Major Professor

Major Professor

(i) Ph.D.:
Students Completed:

- **Shuang Na** (June, 2017), First Position: Data Analyst, Citi Bank.
Title: Time series Online Bayesian kernel density segmentation Applications in Real time Activity Recognition using Smartphone Accelerometer.

- **Vindya I. Kumari Pathirana** (June, 2015), First position: Assistant Professor, University of Connecticut, Waterbury (Fall 2016)
Title: Nearest Neighbor Foreign Exchange Rate Forecasting with Mahalanobis Distance

- **Nabin K. Manandhar Shrestha** (2010) first position: visiting Assistant Professor, Worcester Polytechnic Institute **(WPI),** Mathematical Sciences, 100 Institute Road, Worcester, MA 01609-2280, USA, current position: Biostatistician in MedStar Health Research Institute .
Title: Statistical Learning and Behrens-Fisher Distribution Methods for Heteroscedastic Data in Microarray Analysis.

- **O'Neil Lynch** (2009), first position: Assistant Professor, Minnesota State University Moorhead, MSUM, Department of Mathematics, 1104 7th Ave South | Moorhead, MN 56563 USA.

Title: Mixture distributions with application to microarray data analysis.

- **Florence George** (2007), current position: Associate Professor, Florida International Univesrity, Department of Mathematica and Statistics, Miami, Florida

Title: Gene Johnson Distributions and its Applications to Microarray Data Analysis.

- **Mostafa Abdelelah M** (2006), First Position: Director, Stars Learning Academy, Tampa, Florida.

Title: Regression approach to software reliability Models

Students Current:
Yanjia Zhang (2017-): Adaptive machine learning for streaming data analysis
Stefonova Zheni (2015-): Game theory and statistics for cyber security.
Houston Sanders (2015-)Topic: Statistical methods for cancer data analysis
Shuang Na (2015-), Topic: Streaming data analysis for Human Activity Recognition.
. *Jason Burgess (2015-) Topic: Multi source streaming data analysis*
. **Brian White** (2008-), Topic: Statistical Learning applications to Insurance, Senior Predictive Modeler at FCCI Insurance (2010-current)

(ii) Masters :
Completed:
. Chandramouli, Rajarathnam (Computer Science, 1999), current position: Hattrick chair Professor, Stevens Institute pf Technology, New Jersey.

Undergraduate and High School Student Research Direction

Honors theses: Sagar Shani
Ali Zaidi
Jeannie Gardner, *Nonparametric Bayesian methods for survival analysis,* 2010.
 .
High School Student Research Direction
Two gifted high school students have participated in research experiences with me during the USF Mathematics Summer Program:
. Harley Campbell: *Exploratory data Analysis methods for statistical inference*, 2009.
. Mostafa Bilal: *Technical analysis for stock market prediction*, 2005.

Thesis committees (serving or served, partial list):

(i) Masters: Kevin Frenzel, Paul Martin, C. Dion, Balaji Rajan (Industrial Eng., 2004 -2006), Baskar Mohan (Industrial Eng., 2004- 2006).

(ii) Ph.D.: Qiao Hongzhu, Nalina Suresh, L. Rajaram, Philip L.Wing, Lu Guoqui, Gary Gardner (Computer Science), Kelwyn A. D'Souza (Industrial Eng., 1991), Dhar Subhankar (1997), Liu Xiaoping(1997), Cabana David R, Belyi Sergi, Satish Yadav (EE, 1997), Liu Kejian , Tang Haicheng , Lin Jing , Vincent Camara, Henry Roberts , Paternina Carlos (Industrial and Management systems), Kenneth Dale Grover Jr. (Civil Engineering, 1997), Haiying Ren (Industrial and Management systems, Fall 1998), Francisco Leon (Mechanical Engineering, Fall 1998), Robert Pennington (Mechanical engineering , Fall 1999), Niranjan Pai (Mechanical engineering , Fall 1999), Wes Skinner(2000), Ebrahim Mehranipornejad (Civil Engineering, Spring 2001-), Rajesh Ganeshan (Industrial Eng., 2004-2005), Nicholas Sapankevych (EE, 2005-), Redwan Alqasemi (Mechanical Engineering, 2007), John C. davis (2007), Branko Miladinovic (2008), Carlos A. Molinares (2011), Madhura Rajapakshe (2011, Civil Engineering), Dimitrios Vovoras (2011), Divine T. Wanduku (2012), many more.

RESEARCH INTEREST

Machine learning
Big data
Cyber Security
Streaming data analysis
Queueing processes and communications networks
Deterministic and stochastic control problems
Learning and adaptive systems theory
Delay systems
Stochastic differential games
Game theory applications
Applications of statistics
Software Reliability
Deregulated Electricity market problems
Homeland security problems
Stochastic Modeling in Bioinformatics
Microarray Analysis
Mathematical Finance

INVITED PRESENTATIONS

. "Stochastic Game Models in Cyber Security-a Survey", invited 40 minute talk, Seventh International Conference on Dynamic Systems and Applications & Fifth International Conference on Neural, Parallel, and Scientific Computations, May 27-30, 2015, Morehouse College, Atlanta, Georgia.

.“Bayesian Behrens-Fisher Method for gene selection in Microarray Analysis,” invited 30 minute presentation at THE SIXTH INTERNATIONAL CONFERENCE ON Dynamic Systems and Applications, ATLANTA, U.S.A., MAY 25 - 28, 2011.

. “Applications of Mixture Distributions to Microarray Data Analysis”, invited 40 minute talk, THE FOURTH INTERNATIONAL CONFERENCE ON Neural, Parallel & Scientific Computations, ATLANTA, GEORGIA, 30314, U.S.A., AUGUST 11 - 14, 2010.

. “Analysis of Microarray data for gene selection”, 25th Southern Biomedical Engineering Conference, Miami, Florida, May15-17, 2009, Florence George and K.M. Ramachandran, presented by Florence George.

. “Estimation of Parameter of Johnson’s Distribution and selection of differentially expressed genes Conference in Statistical Methods”, Dept. of Statistics, Florida International University, March 27, 2009. Florence George and K.M. Ramachandran, presented by Florence George

. “A Multiresolution Analysis-Assisted Reinforcement Learning Technique to Control of Sensor Data”, Invited 1 hour colloquium presentation, University of Central Florida, November 6, 2008.

. “A survey of Reinforcement Learning methods in Finance,” One hour invited talk, The International Federation of Nonlinear Analysts (IFNA), WCNA-2008, Orlando, Florida, July 2 through July 9, 2008.

. “A Reinforcement Learning Technique to Run-by-Run Control using Wavelet Modulated Sensor Data”, Invited 1 hour talk, Florida International University, February 8, 2008.

. “A new method of parameter estimation in Johnson’s distribution and application to the Analysis of Microarray Data”, World Congress of Nonlinear Analysts, Orlando, Florida, USA, July2-july9, 2008, Florence George and K.M. Ramachandran, presented by Florence George.

. “Reinforced learning methods for average reward stochastic games”, **Indian Institute of Science,** Bangalore, India, July, 2007.

. “Reinforcement Learning Approach to Run-by-Run Control”, invited 1 hour talk, **Fifth International Conference on Dynamic Systems and Applications,** May 30 - June 2, 2007, **Morehouse College,** Atlanta, Georgia, USA.

. “Application of Johnson System of Distribution in gene selection”, Joint Statistical Meetings in Salt Lake City, Utah, Aug 2007, Florence George and K.M. Ramachandran, presented by Florence George.

▪ "Empirical Bayes Analysis of gene expression data using Johnson's distribution", 5th International Conference on Dynamic Systems and Applications, Atlanta, Georgia, USA, May 30-June 2, 2007 Florence George and K.M. Ramachandran, presented by Florence George.

▪Invited as a resource person to give series of lectures at the Instructional workshop on control of queues, at the Cochin University of Science and Technology, India. 3 one hour presentations on "Control of Heavy traffic methods", Jan 3-4, 2005.

▪ "Optimality in Stochastic differential games with a small noise", Invited 45 minute presentation at the Fourth World Congress of Nonlinear Analysts, Under the auspices of the International Federation of nonlinear Analysts, Orlando, June 30-July 7, 2004.

▪ "Impulsive controls for reflected wideband width process and applications", invited 45 minute presentation at the Fourth International Conference on Dynamical Systems and Applications, Morehouse College, Atlanta, May 21-24, 2003.

▪ "Deterministic representation in two person zero-sum stochastic differential games with a small parameter", invited 20 minute talk at Nonlinear Analysis conference at Melbourne Institute of Technology, Florida,May, 2002.

▪ "Stochastic differential games with multiple modes and a small parameter", invited 25 minute presentation at AMS Special Session on Stochastic Analysis and Applications, New Orleans, January, 2001.

▪ "Wavelets and Hypothesis Testing", invited 45 minute presentation at the Third International Conference on Dynamical Systems and Applications, Morehouse College, Atlanta, May 26-29, 1999.

▪ "Pathwise Average Cost Per Unit Time problem for Stochastic Differential Games" invited 45 minute presentation at International Conference on Differential Equations and Nonlinear Mechanics in UCF, Orlando, March 17-19, 1999.

▪ "Exponential stability of a class of stochastic impulsive systems in terms of two measures" invited one hour talk at the Ninth International Colloquium on Differential Equations, in Plovdiv, Bulgaria, August 18-23, 1998.

▪ "Deterministic approximation to two person stochastic game problems", 45 minute Invited presentation at the International Conference on Differential

Equations and Dynamical Systems (DEDS) at University of Waterloo, Waterloo, Ontario, Canada, during August 1 - 4, 1997.

. Invited to chair AMS session on systems and Communication at AMS Joint Mathematics Meetings, January 8 - 11, 1997, San Deago, California.

. "Convergence problems for an impulsively and singularly controlled queueing systems", 45 minute Invited to presentation at the second world congress of nonlinear analysts (WCNA-96) at Athens, Greece during July 10 - 17, 1996.

. "Direct averaging method for stochastic differential games" 30 minute presentation at AMS Joint mathematics meeting, January 10 -13, 1996, Orlando, Florida.

. " Optimal control problems for heavy traffic queues", 30 minute talk at IEEE Southeastcon '96, April 11 - 14, 1996.

. Invited to present a 30 minute talk at the international conference on Dynamical Systems and Differential Equations, May 29- June 1, 1996, South west Missouri State University, Springfield.

. "N-Person stochastic differential games with a small parameter", 30 minute presentation at Second International conference on DYNAMIC SYSTEMS& APPLICATIONS, May 24-27, 1995, Atlanta, Georgia.

. "Weak convergence methods for control of heavy traffic queues", 45-minute presentation at 14th imacs World Congress at Georgia Tech on Computational and Applied Mathematics, July 11-15, 1994.

. "Stochastic Differential games: Weak Convergence based approach", Colloquium talk at Mathematical Sciences, Clemson University, December 8, 1994.

. "Weak convergence methods in Stochastic Differential games", 45-minute presentation at First International Conference on Dynamical Systems and Applications, Morehouse collage, Atlanta, Georgia, May 26-29, 1993.

. "The stochastic zero-sum differential games with measurement uncertainties", 45-minute presentation at World Congress of NonLinear Analysts, Tampa, Florida, August 19-26, 1992.

. " Stochastic differential games with a wide band noise perturbations", 30- minute presentation at Special session on Weak and strong convergence in applications, ICIAM 91, Washington, DC., July 1991.

. "Stochastic differential games with a small parameter", one hour presentation at Special session on Operator Methods for Control Theory, AMS-meeting #865, Tampa, Florida, 1991.

. "Some weak convergence methods in use", One hour presentation at Mathematics department, LSU, Baton Rough, March 8, 1990.

. "Stochastic stability of delay differential equation with a small parameter", 45-minute presentation at the Conference on Diffusion processes and related problems in analysis, North Western University, Evanston, Illinois, October 23-27, 1989.

. " On random differential delay equations with a small parameter", one hour presentation at AMS - SIAM summer conference on Mathematics of Random Media, Virginia Polytechnic Institute, May 29-June 10, 1989.

CONFERENCE PRESENTATIONS

. Joint Mathematics Meetings, New Orleans, January 6-9, 2011, Title" Cluster K and probabilistic-Nearest-Neighbor Predictions in Foreign Exchange Markets. " (Presenter Vindya Kumari Pathirana, Ph.D. student).

. Joint meetings, San Deago, California, January 8 - 11, 1997, Title: "Stochastic impulsive control problems for reflected diffusions with a small parameter", Presented at AMS session on Systems and Communications.

. 899th AMS meeting, Orlando, Florida, March 17-18, 1995, Title: Weak convergence in N-person stochastic differential games, Presented in Special Session on Nonlinear Dynamical Systems, Chaos and Turbulence.

. " Discrete parameter singular control problem with state dependent noise", presented at AMS Annual Meeting #848, San Antonio, Texas, January 13, 1993.

. " A singularly perturbed stochastic delay system with a small parameter", presented at AMS Meeting #872, Tuscaloosa, Alabama, March 13-14, 1992.
. "Average cost per unit time problems for heterogeneous queues in heavy traffic" presented at ICIAM 91, Washington, DC., July, 1991.

. "Nearly optimal control of delay differential equations with a small parameter", presented at SIAM Conference on Applied Probability in Science and Engineering, March 5-7, New Orleans, LA, 1990.

. "Nearly optimal queues in heavy traffic with heterogeneous servers", presented at AMS Annual Meeting #847, Phoenix, 1989.

HONORS AND MEMBERSHIPS (past and present)

Member National Academy of Inventors
Member of Center for Digital Video at U.S.F.
Membership in American Mathematical Society (AMS).
Membership in SIAM.
Selected for inclusion in the
AcademicKeys Who's Who in Sciences Higher Education (WWSHE)
Leading Professionals of the World 2013, IBC, Cabbridge, England.

PROFESSIONAL ACTIVITIES

Organized five special sessions titled: Stochastic Differential games with applications,

IFNA 2012-Athens, Greece, June 25-July 1, 2012.

Organized five special sessions titled: "Workshop on Applications of Statistics and Probability" at THE SIXTH INTERNATIONAL CONFERENCE ON Dynamic Systems and Applications, ATLANTA, U.S.A., MAY 25 - 28, 2011.

Organizing a special Session (with W.Kim) titled "Advanced Statistical Methods and Applications" at THE FOURTH INTERNATIONAL CONFERENCE ON Neural, Parallel & Scientific Computations, ATLANTA, GEORGIA, 30314, U.S.A., AUGUST 11 - 14, 2010

Organized eleven specials Sessions (with G.S. Ladde, D. Kannan, and A.S. Vatsala) titled "HYBRID AND STOCHASTIC DYNAMIC SYSTEMS AND APPLICATIONS", at the Fifth Congress of Nonlinear Analysis (WCNA-08), Under the auspices of the International Federation of nonlinear Analysts, Orlando, Florida, July 2-July 9, 2008.

Organized five special Sessions (with G.S. Ladde and D. Kannan) titled Stochastic System at the Fourth Congress of Nonlinear Analysis (WCNA-04), Under the auspices of the International Federation of nonlinear Analysts, Orlando, Florida, June 30-July 7, 2004.

Organized two Special Sessions (with G. Ladde) titled random processes and Applications at the Third World Congress of Nonlinear Analysts (WCNA-2000), Catania, Italy, July 19-26, 2000.

Organized two Special Sessions titled *Wavelets Analysis and Applications I & II* at the Third International Conference on Dynamical Systems and Applications, Morehouse College, Atlanta, May 26-29, 1999.

Organized two Special Sessions titled *Stochastic Dynamic Systems I &II* at IEEE Southeastcon '96 at Tampa, Florida, April 11 - 14, 1996.

Organized Three Special Sessions (with R. Darling) on *Stochastic Differential Equations and Applications* I, II, & III, at AMS joint annual mathematics meeting (#908) at Orlando, Florida, January 10-13, 1996.

Organized a Special Session (with G.Yin) titled *Weak and Strong Convergence and applications to stochastic systems* at ICIAM 91, July 8-12,1991, Washington, DC.

Program Committee Member, First International Workshop on Digital and Computational Video (DCV'99), USF, December 10, 1999.

Program Committee Member, Second USF International Workshop on Digital and Computational Video (DCV'01), USF, February 9, 2001.

Faculty Advisor, Nepalis Students Association at USF (2009 -2013)

Refereed papers for the following journals:

. Mathematics of Operations Research
. Journal of Theoretical Probability
. Stochastic Analysis and Applications.
. Journal of Applied Mathematics and Stochastic Analysis
. Stochastics and Stochastics Reports.
. SIAM Journal on Applied Mathematics
. Journal of Combinatorics, Information & System Sciences
. Abstract and Applied Analysis
. Stochastic Processes and Applications
. International Journal of open Problems in Computer Science and Mathematics.

Reviewed for:

. Mathematical Reviews.
. Zentralblatt fur Mathematik / Mathematical Abstracts.

Research proposals reviewed:
. **Invited Panel Reviewer, NSF, STEP program, 2008.**

. **Israel Science foundation**
    . Stochastic jump parameter linear control systems.

Workshops and Conferences:

. Attended IMA work shop on Signal Processing, Minneapolis, June 27- August 5, 1988.

. Attended 3M - IMA joint symposium on Signal Processing, July 19, 1988.

. Attended AMS- SIAM Summer seminar on Mathematics of Random Media, Virginia Tech, Blacksburg, Virginia, May 29- June 9, 1989.

. Attended conference on Probability models and Statistical analysis of Ranking data, Amherst, Massachusetts, June 7-13, 1990.

. Attended AMS-IMS-SIAM 10th Annual joint summer research conferences in the Mathematical Sciences on *Control and Identification of Partial Differential Equations*, Mount Holyoke Collage, South Hadley, Massachusetts, July 11-17, 1992.

. Attended The 1993 Barrett Memorial Lectures on Infinite Dimensioal Stochastic Differential Equations, The University of Tennessee, Knoxville, March 25-27, 1993.

. Attended Wavelets and applications", AMS Short course series, San Antonio, Texas, January 11-12, 1993.

. Attended AMS Meeting #879, Knoxville, Tennessee, March 26 - 27, 1993.

. Attended NSF-CBMS Regional Research Conference on Wavelet Analysis as a tool for Computational and Harmonic Analysis" University of Central Florida, Orlando, May 4-8,1998.

Departmental committees (Recent ones)

Chair: Advisory committee, Statistics Unit, 2010-2017
Member: Statistics graduate admissions, Statistics Unit, 2015-current
Member: Statistics faculty search committee, 2013-14
Member: Statistics faculty search committee, 2009-10
Member: Chair search committee, Department of Mathematics and Statistics, Spring 2009.
Member: Statistics faculty search committee, 2008-09
Chair: Statistics faculty search committee, 2007-08

Grant Workshops

- NSF Workshop on funding opportunities, Washington, D.C., Chair's representative, July 2003.

- Dialog-04, NSF-DMS division, Washington, D.C., Chair's representative, April 30-May1, 2004.

Other Scholarly Contributions

Published Books:

1. Mathematical Statistics with Applications in R, Second Edition, Kandethody M. Ramachandran, and Chris P. Tsokos, Elsevier/Academic Press, 2014, ISBN: 978 0 12 417113 8.
2. Mathematical Statistics with Applications, Kandethody M. Ramachandran, and Chris P. Tsokos, Elsevier/Academic Press, 2009, ISBN: 978 0 12 374848 590000.

3. STOCHASTIC DIFFERENTIAL GAMES: Theory and Applications, Kandethody M. Ramachandran, and Chris P. Tsokos, Atlantis Studies in Probability and Statistics, Volume 2, Atlantis/Springer Press, 2012.
4. STOCHASTIC DIFFERENTIAL GAMES: Theory and Applications, Chinese Translation, Kandethody M. Ramachandran, and Chris P. Tsokos, National Defense Industries Press, 2016.

PUBLICATIONS

Book Chapters

- *Stochastic differential games and applications*, K.M. Ramachandran, in the Hand Book of Stochastic Analysis and Applications, Editors: D. Kannan and V. Lakshmikantham, Marcel Dekker, Inc., pp. 475-534, Chapter 8, October, 2001.

- *Wavelets for Statistical estimation and detection*, R. Chandramouli and K.M. Ramachandran, in the edited volume Wavelets and Signal Processing, Editor: Lokenath Debnath, Birkhauser Boston c/o Springer-Verlag, 2003.

Journal and other publications
Statistics and Applications

- Shuang Na, Kandethody M. Ramachandran, and Ming Ji, Online Bayesian Kernel Segmentation and a application, submitted to IEEE International Conference on Data Mining 2017
- Shuang Na, Kandethody M. Ramachandran, and Ming Ji, Real time Activity Recognition using Smartphone Accelerometer, submitted to Pervasive and Mobile Computing, (9-12-2016), Ref: PMC_2016_80, 2016.

- Nabin K Manandhar Shrestha and Kandethody M Ramachandran, Classification of Cancers by Microarray Gene Expression Data using the Behrens-Fisher Statistic, *Neural, Parallel & Scientific Computations, 2013.*

- D. Mendez, M. Labrador, K. Ramachandran, Data Interpolation for Participatory Sensing Systems, **Pervasive and Mobile computing**, Elsevier, 2012, doi:10.1016/j.pmcj.2012.11.001.

- K. M. Ramachandran, O'Neil Lynch , and Wonkuk Kim, Modified p-value approach for detecting differentially expresed genes in Microarray data, **the proccedings of Dynamic Systems and Applications**, 6, 354-359, 2012.

- Florence George, K.M. Ramachandran, Estimation of Parameters of Johnson's System of Distribution, in Journal of Applied Statistical Methods (JMASM), Vol. 10, 2011, 494-504.

- A.M. Mostafa and K.M. Ramachandran, "Rank Based Methods to Software Reliability Models", *Neural, Parallel, and Scientific Computations*, 19, 397-418, 2011.

- O'Neil Lynch , Kandethody M Ramachandran, and Wonkuk Kim, "Applications of Penalized Mixture Distributions to Microarray Data Analysis", *Neural, Parallel & Scientific Computations*, Vol. 18, 2010, pp 371-384, 2010.

- Florence George, Kandethody M Ramachandran, and Li Lihua, Gene Selection with Johnson's Distribution, in *Journal of Statistical Research,* Vol. **43**, No. 1, 117-125, 2009.

- Florence George and K.M. Ramachandran, Analysis of Microarray Data for Gene Selection, in IFMBE Proceedings 24, 25th Southeren Biomedical Engineering Conference, May 15-17, Springer Berlin Heidelberg, 2009, Miami, Florida, 237-238, 2009.

- Florence George and Kandethody M Ramachandran, "A Mixture Model approach for Gene selection using Johnson's system and Bayes formula", in *Neural, Parallel, and Scientific Computations*, Vol. 16, no. 1, pp. 45-57, 2008.

- Florence George and Kandethody M Ramachandran, Applications of Johnson System of distribution in gene selection, JSM Proceedings, 2007.

- Nabin K Manandhar Shrestha and Kandethody M Ramachandran, "Behrens-Fisher's distribution for selecting differentially Expresses Genes", in *Neural, Parallel, and Scientific Computations*, Vol. 16, no. 1, pp. 147-163, 2008.

- A.M. Mostafa, K.M. Ramachandran, and A.N.V. Rao, "Regression approach to software reliability models, in *International Journal of Pure and Applied Mathematics (IJPAM)*, Vol. 26, No.2, 2006.

- R. Chandramouli and K.M. Ramachandran, **"**Wavelets and Hypothesis testing", in the proceedings of the Third International Conference on Dynamical Systems and Applications, Morehouse College, Atlanta, May 26-29, 1999, 2001.

- R. Chandramouli and K.M. Ramachandran, "Multiresolution De-noising for Low SNR", *Wavelet Tranforms and Time-frequency Signal Analysis* , L. Debnath (Ed.), Electronic Publishing House, 1999.

Stochastic games and applications

Cyber Security

- Zheni Stefanova, and Kandethody Ramachandran, Network Attribute Selection, Classification and Accuracy (NASCA) Procedure for Intrusion Detection Systems, IEEE Explore, 2017 IEEE International Symposium on Technologies for Homeland Security (HST), 2017.
- Kandethody Ramachandran and Zheni Stefanova, "Dynamic Game Theories in Cyber Security" Proceedings of Dynamic Systems and Applications 7 (2016) 303–310

Weak Convergence methods

- K.M. Ramachandran "Deterministic approximation in N-person stochastic differential games with a small parameter", in *Dynamic systems and Applications*, 15, 2006.

- K.M. Ramachandran "Stochastic differential games with multiple modes and a small parameter", in *Journal of Stochastic Analysis and Applications*, Vol. 24, No.5, pp.913-928, 2006.

- K.M. Ramachandran and A.N.V. Rao, "Differential Inequality approach for deterministic approximation in two person zero-sum stochastic differential games", *Nonlinear Analysis,* Vol. 63, issue 5-7, e1999-e2008, 2005.

- K.M. Ramachandran and A.N.V. Rao, "Deterministic representation in two person zero-sum stochastic differential games with a small parameter", (N-person stochastic differential games with wideband noise perturbations: pathwise average cost per unit time problem.) in *International Journal of Pure and Applied Mathematics (IJPAM)*, vol. 13, No. 1, 2004.

- K.M. Ramachandran and A.N.V. Rao, "N-person stochastic differential games with wideband noise perturbations: Pathwise average cost per unit time problem", in *Dynamical systems and applications*, Vol. 11, No. 1, 2002.

- K.M. Ramachandran, "Pathwise zero-sum stochastic differential games with a small parameter", in the proceedings of the International Conference on Differential Equations and Nonlinear Mechanics, K. Vajravelu (Ed.), Mathematics and its applications Vol: 528, Kluwer academic publishers,   pp. 293-308, 2001.

- K.M. Ramachandran, "A Convergence Method for Stochastic Differential Games with a Small Parameter," *Stochastic Analysis and Applications*, Vol. 17, No. 2, pp 219-252, 1999.

- K.M. Ramachandran and A.N.V. Rao, "Deterministic approximation to two person stochastic game problems", in *Dynamics of Continuous, Discrete and Impulsive Systems*, 1998.

- K.M. Ramachandran, "Weak convergence in N-person stochastic differential games", in the *proceedings of Second International Conference on Dynamical Systems and Applications*, Vol. 2, pp. 461-467, 1996.

- K.M. Ramachandran, "The stochastic zero-sum differential games with measurement uncertainties", *Proceedings of the first world congress of Nonlinear Analysts*, Tampa, Florida, August 19-26, 1992, pp. 1651 - 1661, 1996.

- K.M. Ramachandran, "N-Person stochastic differential games with wideband noise perturbation" , *Journal of Combinatorics, Information & System Sciences*, Vol. 21, Nos. 3-4, pp. 245 - 260, 1996.

- K.M. Ramachandran, "Weak convergence of partially observed zero-sum stochastic differential games," *Dynamical systems and Applications*, Vol 4, No. 3, 329 - 340, 1995.

- "Stochastic differential games with a small parameter", K.M. Ramachandran, *Stochastics and Stochastics Reports*, Vol 43, 73-91, 1993.

Reinforcement Learning Methods, Wavelet Based Multiresolution Analysis and Applications

- Rajesh Ganeshan, Tapas Das, and K.M. Ramachandran, "A Multiresolution Analysis-Assisted Reinforcement Learning Approach to Run-by-Run control", in *IEEE Transactions on Automation Science and Engineering*, Vol. 4, 2, pp. 182-193, 2007.

- M.A.L. Thathachar and K.M. Ramachandran,"Asymptotic behavior of a hierarchical systems of learning automata", *Information Sciences,* Vol. 35, No. 2, 91-110, 1985. MR 86k: 68077.

- M.A.L. Thathachar and K.M. Ramachandran, "Asymptotic behavior of a learning algorithm", *Int. J. Control*, Vol. 49, No. 4, 827-838, 1984. MR 85i: 68034.

Weak convergence and near optimal controls

- K.M. Ramachandran, "Nearly optimal impulsive controls for reflected wideband width processes", *Journal of Stochastic Analysis and Applications*, 1369-1389, Vol. 21, No. 6, 2003.

- K.M. Ramachandran, "Convergence problems for an impulsively and singularly controlled system", in the _proceedings of WCNA-96_, 1996; _Nonlinear Analysis, Theory, Methods & Applications_, Vol. 30, No.1, pp. 223 - 232, 1997.

- K.M. Ramachandran, "Discrete parameter singular control problems with state dependent noise and non smooth dynamics", _Stochastic Analysis and Applications_, Vol. 12, No.2, 261-276, 1994.

- H.J. Kushner, and K.M. Ramachandran, "Nearly optimal singular controls for wide band noise driven systems", _SIAM J. on Control and Optimization_, Vol. 26, No.3, 569-591, 1988 . MR 89c: 93082

Queueing Theory and Networks

- K.M. Ramachandran," Heavy traffic queues with heterogeneous servers: Pathwise average cost per unit time problem ", _Stochastic Analysis and Applications_, Vol.14, No. 4, pp. 433-459, 1996.

- K.M. Ramachandran, "Optimal control problems for heavy traffic queues", _Proceedings of IEEE Southeastcon '96_ at Tampa, Florida, April 11 - 14, pp. 80-83, 1996.

- K.M. Ramachandran, "Nearly optimal controls for singularly perturbed wide band noise systems", _Stochastic Analysis and Applications_, Vol. 13, No.3, 335 - 353, 1995.

- H.J. Kushner and K.M. Ramachandran, "Optimal and approximately optimal control policies for queues in heavy traffic", _SIAM J. on Control and Optimization_, Vol. 27, No. 6, 1293-1318, 1989. MR 91g: 93008.

- K.M. Ramachandran,"Nearly optimal control of queues in heavy traffic with heterogeneous servers", _Stochastic Analysis and Applications_, Vol. 35, No. 2, 211-234, 1989. MR 91a: 93063.

Delay systems and control

- K.M. Ramachandran, Stability of stochastic delay differential equation with a small parameter, _Stochastic Analysis and Applications_, Volume 26, Issue 4 July 2008 , pages 710 - 723 .

- K.M. Ramachandran and G. Yin, "Nearly optimal state feedback controls for delay differential equations with a small parameter", _Journal of Mathematical Analysis and Applications_, Vol. 172, No. 2, 480 - 499, 1993, MR 93j: 49030.

- K.M. Ramachandran, "A singularly perturbed stochastic delay system with a small parameter", _Stochastic Analysis and Applications_, Vol. 11, No. 2, 209 - 230, 1993.

- G. Yin and K.M. Ramachandran,"On random delay differential equations with a small parameter", *Mathematics of Random Media*, Ed. W.E. Kohler and B.S. White, <u>*Lectures in Applied Mathematics*</u>, Vol. 27, 1991, 269-283.

- G. Yin and K.M. Ramachandran, "A differential delay equations with a wide band noise perturbations" *Stochastic Processes and its Applications*, Vol. 35, 231-249, 1990.

Financial Mathematics

- Vindya I. Kumari Pathirana and Kandethody M. Ramachandran, Mahalanobis Based k-Nearest Neightbor Forecasting versus Time Series Forcasting Methods, submitted to *International Journal of Mathematical Modelling and Numerical Optimization (IJMMNO)*, 2015.
- Vindya I. Kumari Pathirana and K. M. Ramachandran, The Distance choice and Optimal Parameter selection in k-NN Algorithm for FX-data, in Communications in Applied Analysis, July 2014.
- Vindya I. Kumari Pathirana and K. M. Ramachandran, "*k*-Nearest Neighbor Algorithm with Mahalanobis Distance for FX Trading," in the proccedings of **Dynamic Systems and Applications, 6, 324-328, 2012,** The SIXTH INTERNATIONAL CONFERENCE ON Dynamic Systems and Applications, ATLANTA, U.S.A., MAY 25 - 28, 2011.

General
- K.M. Ramachandran and Gur Dial, "Comments on - Trigonometric Entropies, Jensen difference divergence measures, and error bounds", *Information Sciences*, Vol.56, 1991, 283-284.

Education papers

- Catherine Bénéteau, Gordon Fox, Xiaoying Xu, Jennifer Lewis**, Kandethody Ramachandran**, Scott Campbell, and John Holcomb, "Peer-Led Guided Inquiry in Calculus at the University of South Florida ," *Journal of STEM Education*, Volume 17, Issue 2, April-June 2016, pp 5-13.

- Gordon Fox, Scott Campbell, Arcadii Grinshpan, Xiaoying Xu, John Holcomb, Catherine Bénéteau, Jennifer Lewis, and **Kandethody Ramachandran**, "Implementing Projects in Calculus on a Large Scale at the University of South Florida", submitted to Journal of STEM Education: Innovations and Research., 9-4-2016.

Preprints/Working papers

- Vindya Kumari and K.M. Ramachandran, Nearest-Neighbor multi-day Predictions in Foreign Exchange Markets, working paper, 2016.

- VINDYA I. KUMARI PATHIRANA AND KANDETHODY M. RAMACHANDRAN, MAHALANOBIS BASED k-NEAREST NEIGHBOR FORECASTING VERSUS TIME SERIES FORECASTING METHODS, Preprint, 2016

- Brian White, and K.M. Ramachandran, Prediction Targets in Insurance Applications, working paper, 2016
- Brian White, and K.M. Ramachandran, Ensemble learning methods in Property and Casualty Industry, working paper, 2016
- .Shuang Na, Kandethody Ramachandran, and Ming Ji, Online Time Segmentation Methods: a Review, working paper, 2016
- Shuang Na, Kandethody Ramachandran, and Ming Ji, Online Activity Recognition using Smartphone Accelerometer, working paper, 2016

- Jason Burgess, and K.M. Ramachandran, SOM for HMM parameter estimation, working paper, 2016

- Kandethody M Ramachandran, Numerical Solutions for Stochastic Differential Games With Regime Switching: Ergodic Payoff, working paper, 2016.

Books (In preperation)
- Kandethody Ramachandran, and Ming Ji, Predictive modeling and applications with R, 2016.

Funding Applied and Pending (Most recent)

- NSF-TRIPODS: Interdisciplinary Data Sciences Institute (IDSI), 3-15-2017,PI, 1.5 million, Co-PIs: Tapas Das, Yicheng Tu, Paul Rosen, Wen-Xiu Ma, and Lu Lu.
- NSF-DMS-STATISTICS: Real-Time Streaming Data Analysis and Applications, 11-7-2016, PI, $301997 (Pending)
- **NRT-DESE**: TOWARDS AN INTERDISCIPLINARY TASKFORCE FOR COMPU-CELLOMICS, NSF-NRT, Co-PI, $2999525 (PI-Sanjukta Bhanja, Co-PIs: Yicheng Tu, Sagar Pandit, Shyam Mohapatra, Kandethody Ramachandran, Co-I: Subra Mohapatra, Stanley Stevens, Bernard Batson), submitted 2-9- 2016 (Rejected)

- **NRT-DESE– COMPETENCY-BASED COMPUTATION-CENTRIC COMMUNITY FOR STEM TASKFORCE (C^{3}ST)**, NSF-NRT, Co-PI, $2996401 (PI-Sanjukta Bhanja), submitted on 5-6-2015. (Rejected)