Curriculum Vitae

Personal Data

Name	Muhammad Yousuf
Address	Department of Mathematics and Statistics
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	Dhahran 31261, Saudi Arabia
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Academic Qualifications

Year	Degree	University	Subject
2005	Ph. D.	University of Wisconsin – Milwaukee Milwaukee, Wisconsin, USA	Applied Mathematics (Numerical Analysis)
1997	M. S.	King Fahd University of Petroleum and Minerals Dhahran, Saudi Arabia	Applied Mathematics (Numerical Analysis)
1992	M. Sc.	University of the Punjab, Lahore, Pakistan	Applied Mathematics
1988	B. Sc.	University of the Punjab, Lahore, Pakistan	Mathematics & Statistics

Academic Positions

Year	Position	Institution
2006 – Continue	**Assistant Professor**	Department of Mathematics and Statistics King Fahd University of Petroleum and Minerals Dhahran 31261, Saudi Arabia
2005 – 2006	**Assistant Professor**	Department of Mathematics and Physics Alfred State College, Alfred, NY 14802, USA
2000 – 2005	**Teaching Assistant**	Department of Mathematical Sciences University of Wisconsin – Milwaukee Milwaukee WI 53211, USA
1997 – 2000	**Lecturer**	Department of Mathematical Sciences King Fahd University of Petroleum and Minerals, Dhahran 31261, Saudi Arabia

1994 –1996	**Research Assistant**	Department of Mathematical Sciences
		King Fahd University of Petroleum and Minerals,
		Dhahran 31261, Saudi Arabia
1992 – 1994	**Lecturer**	Garden College, Lahore, Pakistan

Courses Taught:

Course name	Course Number
College Algebra and Trigonometry	Math 001 and Math002
Calculus	Math 101, Math 102, and Math 201
Elements of Differential Equations	Math 202
Finite Mathematics	Math 131
Introduction to Differential Equations and Linear Algebra	Math 260
Methods of Applied Mathematics	Math 301
Engineering Mathematics	Math 302
Mathematical Methods for Engineers	Math 513
Numerical Analysis of Ordinary Differential Equations	Math 571
Advanced Mathematical Methods	Math 514

Course Coordination

Course #	Course Name	
Math 201	Calculus III	
Math 202	Elementary Differential Equations	
Math 201	Calculus III	
Math 002	College Algebra and Trigonometry	

Courses Studied

Real Analysis, Numerical Analysis, Complex Analysis, Functional Analysis, Algebra, Linear Algebra, Partial Differential Equations, Mathematical Methods, Calculus of Variations, Topology & Functional Analysis, Electricity & Magnetism, Mathematical Statistics, Quantum Mechanics

IT Expertise

- **Languages:** LaTeX, C++

- **Systems:** Microsoft Windows

- **Mathematical Packages:** Matlab, Maple, Scientific Workplace, Microsoft Office
- **Others:**   WebCT, Blackboard, My Math Lab (online teaching)

Research Interests and Publications

Applied Mathematics, Numerical Analysis, Partial Differential Equations, Financial Mathematics

Ph.D. Dissertation Title: "Smoothing Schemes for Inhomogeneous Linear and Semilinear Parabolic Problems with Nonsmooth Data"
Advisor: Professor Bruce A. Wade

M.S. Thesis Title: "On The Marginal Stability of Interval Matrices"
Advisor: Professor M. B. M. Elgindi

Publications

[1] **M. Yousuf**, M. B. M. Elgindi, M. A. El-Gebeily, "Necessary and Sufficient Conditions for Regularity and Stability of Interval Matrices", International Journal of Computer Mathematics 73.3-4 (1999): 10.

[2] B.A. Wade, A.Q.M. Khaliq, M. Siddique, and **M.Yousuf**, "Smoothing with Positivety - Preserving Padé Schemes for Parabolic Problems with Nonsmooth Data", Numerical Methods for Partial Differential Equations, Vol. 21, Issue 3, pp. 553-573, 2005.

[3] **M. Yousuf,** A.Q.M. Khaliq, B.A. Wade, "Numerical PDE Approach for the Valuation of Exotic Options", presented at the Conference on Risk Management and Quantitative Approaches in Finance, April 6 - April 8, 2005, University of Florida.

[4] A.Q.M. Khaliq, D.A. Voss, **M. Yousuf**, "Pricing Exotic Options with L-Stable Padé Schemes", Journal of Banking and Finance, Vol. 31, Issue 11, pp. 3438-3461, 2007.

[5] A.Q.M. Khaliq, B.A. Wade, **M. Yousuf**, J. Vigo Augiar, "Higher Order Smoothing Schemes for Inhomogeneous Parabolic Problems with Applications to Nonsmooth Payoff in Option Pricing", Numerical Methods for Partial Differential Equations, Vol. 23, Issue 5, pp. 1249-1276, 2007.

[6] B.A. Wade, A.Q.M. Khaliq, **M. Yousuf**, J. Vigo Augiar, R. Deininger "On Smoothing of Crank-Nicolson Scheme and Higher Order Schemes for Pricing Barrier Options", Journal of Computational and Applied Mathematics, Vol. 204, Issue 1, pp. 144-158, 2007.

[7] A.Q.M. Khaliq, J. Martin, B.A. Wade, **M. Yousuf**, "Smoothing schemes for reaction-diffusion systems with nonsmooth data", Journal of Computational and Applied Mathematics Vol. 223, pp. 374–386, 2009.

[8] **M. Yousuf**, "Efficient Smoothing of Crank-Nicolson Method for Pricing Barrier Options Under Stochastic Volatility", PAMM · Proc. Appl. Math. Mech. 7, pp. 1081101–1081102, 2007, / DOI 10.1002/pamm.200700249**, available online** at http://www3.interscience.wiley.com/journal/120747892/abstract

[9] **M. Yousuf**, "On the Class of High Order Time Stepping Schemes Based on Padé Approximations for Numerical Solution of Burgers' Equation", Applied Mathematics and Computation Vol. 205 pp. 442–453, 2008.

[10] **M. Yousuf**, "A Fourth Order Smoothing Scheme for Pricing Barrier Options under Stochastic Volatility", International Journal of Computer Mathematics, Vol. 86, Issue 6, pp. 1054 – 1067, 2009.

[11] **M. Yousuf**, "Efficient L-Stable Method for Parabolic Problems with Application to Pricing American Options under Stochastic Volatility", Applied Mathematics and Computation Vol. 213, pp. 121–136, 2009. Available online at http://dx.doi.org/10.1016/j.amc.2009.02.060.

[12] K. Masood, **M. Yousuf**, "Numerical Solution for Inverse Initial Problems in Heat Equation Finite differences and Padé Approximations", Numerical Heat Transfer, Part A: Applications: An International Journal of Computation and Methodology, 1521 - 0634, Volume 57, Issue 9, 2010, Pages 691 – 708.

[13] **M. Yousuf**, A. Q. M. Khaliq, B. Kleefeld, "The numerical approximation of nonlinear Black--Scholes model for exotic path--dependent American options with transaction cost", International Journal of Computer Mathematics, Vol 89, Issue 9, 1239-1254, June 2012.

[14] **M. Yousuf**, A. Q. M. Khaliq, "An Efficient ETD Method for Pricing American Options Under Stochastic Volatility with Nonsmooth Payoffs", Numerical Methods for Partial Differential Equations, Volume 29, Issue 6, 1864-1880, Nov 2013.

[15] Saeed M. Ali, A. H. Bokhari, M. Yousuf, and F.D. Zaman, "A Spherically Symmetric Model for the Tumor Growth http://dx.doi.org/10.1155/2014/726837," *Journal of Applied Mathematics*, vol. 2014, no. 726837, pp. 1-7, 014. http://dx.doi.org/10.1155/2014/726837

[16] M. Yousuf, A. Q. M. Khaliq, R.H. Liu, " Pricing American options under multi–state regime switching with an efficient L– stable method", International Journal of Computer Mathematics. Accepted for publication.

Thesis Examiner

External Evaluator of a Ph.D. thesis, National College of Business Administration & Economics Lahore, Pakistan, 2009.

Funded Research Projects

#	Title	Principal Investigator	Members	Sponsor	Grant	Ref #	Start Date	End Date	Status
1	PDE Approach for Valuation of Complex Derivative Securities Under Stochastic Volatility	M. Yousuf	F. Zaman	KFUPM	Junior Faculty	JF 070005	Apr 2007	May 2008	Completed
2	Regularization of Initial Inverse Problems in Heat Equations Using finite	M. Yousuf	K. Masood	KFUPM	Fast Track	FT 080007	Mar 2008	Mar 2009	Completed

	Difference Methods and Positively Deserving Padé Scheme								
3	High Order Time Stepping Schemes for Valuation of Complex Derivative Securities under Transaction Cost and Stochastic Volatility	Yousuf, M.	A. Q. M. Khaliq	KFUPM	Fast Track	FT100003	Mar 2010	Feb 2011	Completed
4	Numerical and Analytic Solutions of Travelling Waves in Ferroelectric Smectic-C Liquid Crystals	Yousuf, M.	F.D. Zaman A. H. Bokhari	KFUPM	Fast Track	SB100010	Mar 2010	Feb 2011	Completed
5	On a Spectral Collocation Method for Numerical Solution of a Class of Linear and Nonlinear Differential Equations with and without Noisy Forcing Functions	Yousuf, M.	M. A. Bokhari M. M. Malik	KFUPM	Sabic	SB101025	May 01, 2011	April 30, 2012	Completed
6	Valuation of American	Yousuf, M.	A. Q. M. Khaliq	KFUPM	Sabic/Fast Track	IN111008			Completed

	Options with Stochastic Volatility under Regime-Switching		R. H. Liu						
7	Valuation of American Options under Multistate Regime-Switching with Jumps	Yousuf, M.	A. Q. M. Khaliq R. H. Liu	KFUPM	Internal	IN141026	Mar 01, 2015	Mar 01, 2017	Completed

Conferences Attended

1. The Second International Conference on Mathematics and Statistics, April 02–05, 2015, Sharjah, UAE
2. UAE MATH DAY United Arab University, April 27, 2013, Al Ein UAE
3. The First International Conference on Mathematics and Statistics AUS-ICMS 10, March 18 – 21, 2010, American University of Sharjah, UAE.
4. Track Chair Financial Mathematics, Third International Conference on Modeling, Simulation, and Applied Optimization (ICMSAO'09), January 20-22, 2009, American University of Sharjah, UAE.
5. Third International Conference on Mathematical Sciences, ICM-2008, March 03-06, Al-Ain, UAE.
6. Sixth International Congress on Industrial and Applied Mathematics, ICIAM07, July 16-20, 2007, Zurich, Switzerland.
7. Midwest Numerical Analysis Conference, May 20-22, 2005, University of Iowa, Iowa, USA.
8. Midwest Numerical Analysis Day, April 24, 2004, University of Wisconsin-Milwaukee, USA.
9. Two days Numerical Analysis Workshop, November 8-9, 1999, at King Fahd University of Petroleum and Minerals, Dhahran Saudi Arabia.

Technical Seminars, Presentations & Workshops

Title	Date	Place

An Efficient Implicit Predictor-Corrector Method For Pricing American Option Under Multi-State Regime-Switching	April 02–05, 2015	The Second International Conference on Mathematics and Statistics, Sharjah, UAE
Solving Complex PDE Systems for Pricing American Options with Regime-Switching by Efficient L – stable Exponential Time Differencing Method	April 27, 2013	UAE MATH DAY United Arab University, Al Ein UAE
Gauss-Legendre Spectral Collocation Method for Numerical Solution of Second Order Linear Differential Equations (improved version).	March 20, 2010	The First International Conference on Mathematics and Statistics AUS-ICMS 10, March 18 – 21, American University of Sharjah, UAE.
Gauss-Legendre Spectral Collocation Method for Numerical Solution of Second Order Linear Differential Equations.	May, 2008	Department of Mathematics and Statistics, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
Numerical Solution of Fisher's Equations Using Efficient L-Stable Method	March 03-06, 2008	Third International Conference on Mathematical Sciences, ICM-2008, March 03-06, Al-Ain, UAE.
On the Smoothing of Crank-Nicolson Method and Higher order Methods for Pricing Barrier Options under Stochastic Volatility	July 16, 2007	6th International Congress on Industrial and Applied Mathematics, July 16-20, 2007, Zurich, Switzerland
Numerical Solution for Inverse Initial Problems in Heat Equation Using Positivity Preserving Padé Schemes	April 17, 2007	Department of Mathematics and Statistics, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
Elementary Level Workshop on Maple	April 01& 08 2007	Department of Mathematics and Statistics, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
Higher Order Smoothing Schemes for Inhomogeneous Parabolic Problems with Applications to Nonsmooth Payoff in Option Pricing	February 08, 2007	Centre for Advanced Studies in Mathematics, Lahore University of Management Sciences (LUMS), Pakistan
Higher Order Smoothing Schemes for Inhomogeneous Parabolic Problems with Applications to Nonsmooth Payoff in Option Pricing	November 2006	Department of Mathematics and Statistics, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia

Introduction to Matlab Programming	October 2006	Two days workshop for Aerospace Engineering Club Students at King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia	
Numerical PDE Approach for the Valuation of Exotic Options	May 20 – 22, 2005	Midwest Numerical Analysis Conference, University of Iowa, Iowa, USA.	

Committee Work: Administrative and Public Services

Committee	Position	Date	Formed by
Teaching and Learning Committee	Member	2010/2011	King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Excellence in Teaching and Excellence in Advising Committee	Chairman	2009/2010	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Program Assessment Committee	Chairman	2009/2010	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Program Assessment Committee	Chairman	2008/2009	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
ITCT Committee	Member	2008/2009	King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Book Selection Committee for Math 673	Member	2008/2009	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Book Selection Committee for Math 131 & 132	Member	2008/2009	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Committee for Online Homework for Math and Stat courses	Member	2008/2009	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
MS actuarial science Committee	Member	2008/2009	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Program Assessment Committee	Chairman	2007/2008	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
Program Assessment Committee	Member	2006/2007	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

Teaching Committee	Member	2006/2007	Department of Mathematics and Statistics King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

Since joining KFUPM in 2006, I have been involved in many standing and ad-hoc committees. I have attended all the committee meetings and actively participated in the different activities of the committees. I have been associated with the Program Assessment Committee for the last four years: for one year as a member and for three years as Chairman of the Committee.

In 2009, a team of three distinguished professors was invited from USA to assess our BS Math program. Being the Chairman of the Department Program Assessment Committee, I was actively involved in making all the necessary arrangements to facilitate their arrival and stay in Saudi Arabia and coordination of the whole assessment exercise. These arrangements include flight reservations, welcome on the airport, hotel reservations, transportations, etc. While staying at KFUPM, the team was involved in such activities as meeting with the Department Chairman, the College Dean, Math and Stat faculty and interviewing the students. I prepared the activity schedule for the assessment team. The assessment team presented their report to the Rector of the university. Later, I presented the assessment report in a Department Council meeting.

I am serving as Chairman of the Program Assessment Committee for NCAAA accreditation. The task of this committee is to prepare a series of documents including program specifications, course specifications, course reports, self evaluation scales, program reports and program self study reports. I presented templates of program specifications, course specifications and course reports to facilitate completion of these documents.

I have also been Nominated by the Dean of College of Sciences as College coordinator in the University Teaching and Learning Committee for NCAAA accreditation.

I explained through presentation "How to Prepare a Course Report According to NCAAA Format" in the Physics department – April 14, 2010.

I am assigned by the DAD, to present "How to Prepare a Course Specification and a Course Report According to NCAAA Format" in a workshop soon after the spring break of the semester 091.

I also served as chairman of the Excellence in Teaching and Excellence in Advising Award committee – 2009/2010. This committee reviewed the necessary documents and nominated two faculty members from the department for Excellence in Teaching Award.

AWARDS AND DISTINCTIONS

- Chancellor's Graduate Student Award, University of Wisconsin Milwaukee, 2002 – 2003, 2003 – 2004, and 2004 – 2005

- Annual Academic Record and Performance Evaluation, King Fahd University of Petroleum and Minerals

Distinguished	2011 - 2013
Distinguished	2009 - 2011
Distinguished	2007 - 2009
Distinguished	2006 - 2007
Distinguished	1998 - 1999
Distinguished	1997 – 1998
Excellent	1996 – 1997