

MEGHNA MITTAL

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EDUCATION

Ph.D. in Pure Mathematics	August 2010	University of Houston GPA – 4.0
<i>Advisor: Vern I. Paulsen</i>		
M.S. in Pure Mathematics	August 2006	University of Houston GPA – 4.0, overall 4.0
B.Sc. (Honors) in Mathematics	May 2003	University of Delhi, New Delhi, India

ACADEMIC EXPERIENCE

<i>Visiting Assistant Professor (Aug 2010 - Present)</i>	Carnegie Mellon University
▪ <i>Differentiation and Integral Calculus (78 students)</i>	<i>(Math 21-120)</i>
▪ <i>Integration and Differential Equations (68 Students)</i>	<i>(Math 21-121)</i>
▪ <i>Calculus II (19 + 25 Students)</i>	<i>(Math 21-112)</i>
▪ <i>Calculus of Approximations (52 students)</i>	<i>(Math 21-123)</i>
▪ <i>Calculus in Three Dimensions (145 + 73 students)</i>	<i>(Math 21-259)</i>

<i>Instructor (Jan 2010 – May 2010)</i>	University of Houston
▪ <i>Calculus III (126 Students)</i>	<i>(Math 2433)</i>

<i>Lead Teaching Assistant (Aug 2008 – May 2010)</i>	University of Houston
▪ Successfully managed schedules of all Math Department TAs, resolved schedule conflicts	
▪ Coordinated work between professors and TAs, overviewed grading schedules	
▪ Planned and organized weekly teaching-learning seminars	

<i>Teaching Assistant (Aug 2005 – Aug 2009, Summer 2010)</i>	University of Houston
▪ Taught Recitation Sections	
<i>Math 1431 Calculus I</i>	<i>Fall 2006, Spring 2008</i>
<i>Math 1432 Calculus II</i>	<i>Spring 2007, Fall 2008, Spring 2009</i>
<i>Math 2433 Calculus III</i>	<i>Fall 2007, Summer 2010</i>
▪ Tutor at University Math lab	
▪ Grader for various undergraduate courses	

<i>Instructional Assistant (June 2008 – Aug 2008)</i>	University of Houston
Worked with Prof. Mathew Nicol to design and structure course material for graduate level course Math 6383 Probability models and Mathematical Statistics.	

RESEARCH INTERESTS

Functional analysis: Function theory, C^* algebras, Operator theory, Operator algebras, and Harmonic Analysis. For more information please see my research statement.

PUBLICATIONS

- *An operator algebraic proof of Agler's factorization theorem*, with Sneh Lata and Vern I. Paulsen, Proc. AMS, **137**(2009), No. 11, 3741-3748.
- *Operator Algebras of Functions*, with Vern I. Paulsen, Jour. of Funct. Anal., **258** (2010), No. 9, 3195-3225.
- *A Finite Multiplicity Helson-Lowdenslager-De Branges theorem*, with Sneh Lata and Dinesh Singh, to appear in Studia Math.
- *Function theory on the quantum annulus and other domains*, Ph.D. Thesis, University of Houston, August 2010.
- *Extremal Theory for the Quantum Annulus*, work in progress.

RESEARCH PRESENTATIONS

- *Introduction to Operator Theory*, Undergraduate Colloquium, Carnegie Mellon University, October 2010, Invited.
- *Pick-Interpolation and its application*, Undergraduate Talk, University of Minnesota, May 2010, Invited.
- *Operator algebras and Quantum Domains*, Analysis Seminar, Texas A&M, March 2010, Invited.
- *Function theory on a Quantum domain*, Joint Mathematical Meeting, January 2010.
- *Function theory on Quantum domains*, Analysis Seminar, University of Houston, September 2009.
- *Operator Algebras of Functions*, Multivariate operator theory workshop, Fields Institute, University of Toronto, August 2009.
- *Operator Algebras of Functions*, Great Plains Operator Algebra Symposium, University of Colorado, June 2009.
- *Nevanlinna-type result for an Annulus*, Graduate Research Seminar, University of Houston, October 2008.

TEACHING PRESENTATIONS

- *Dealing with pedagogical issues*, Teaching-Learning seminar, University of Houston, January 2010.
- *How to be an Effective TA*, Teaching-Learning seminar, University of Houston, September 2009.

CONFERENCES ATTENDED

- *26th Southeastern Analysis meeting*, Georgia Tech, GA, March 2010.
- *Joint mathematics meeting*, San Francisco, CA, January 2010.
- *East Coast Operator Algebra Symposium*, Texas A&M University, October 2009.
- *Multivariate Operator Theory workshop*, Fields Institute, University of Toronto, Canada, August 2009.
- *Great Plains Operator Theory Symposium*, University of Colorado, June 2009.
- *A concentration week on Multivariate operator theory*, Texas A&M University, July 2008.
- *Great Plains Operator Theory Symposium*, University of Cincinnati, June 2008.

ACADEMIC ACHIEVEMENTS

- *Frontier Fiesta Graduate Scholarship* for academic excellence, University of Houston, 2009-2010.
- *Research assistant* under NSF grant DMS-0600191 (Fall 2009, Summer 2009, 2007)
- *Scholarship for excellence in Research and Graduate studies*, University of Houston, 2006-2007.
- *Research assistant* for Professor Nicol, Summer 2008.
- *Graduate Assistant Teaching Fellowship* for academic excellence, University of Houston, 2005-Present.
- *Gold Medalist*, 2000 – 2003, Bachelors of Science (Math), University of Delhi, New Delhi, India.
- *Best all rounder student* (Senior Year) for participating in all activities in high school, 2000.

OUTREACH AND SERVICE

- *Chaired the contributed paper session on ``Functional Analysis and Operator Theory II''*, AMS Joint Mathematics Meeting, Jan 2010.
- *High School Mathematics Contest* University of Houston, 2007, 2008
Volunteered to organize and manage this event of 500 students which includes a problem-solving competition.
- *Mathematical Helpline* Mathematical Sciences Foundation, 2005
Volunteered to help middle school and high school students in solving mathematical problems over the phone and internet. Also, counseled students on exam anxiety related issues.
- *Pioneered the Organization of Mathematical Society at the University of Delhi* in year 2000.
Coordinated and managed 50 students, conducted mathematical quizzes, seminars and talks.

PROFESSIONAL ACTIVITIES / DEVELOPMENTS

- Participated in *HyTES Training Program*, a program for instructors to explore and learn technology based tools for mathematics to aid teaching in classrooms, July – Aug 2008.
- Member of Association for Women in Mathematics (*AWM*), 2008-Present.
- Member of American Mathematical Society (*AMS*), 2005-Present.
- Former member of *Analysis group* at the University of Houston, Aug 2005- Aug 2010.

COURSEWORK

Pure Mathematics

Functional Analysis, Topology, Complex Analysis, Real Analysis, Algebra, Matrix Theory, Multivariable Harmonic analysis, K-Theory, Theory of C*-Algebras, C*-Algebras and Operator Space Theory, Topological Groups, Reproducing Kernel Hilbert Spaces.

Applied Mathematics

Probability models and mathematical statistics, Stochastic differential equations(audit), Information theory, Partial differential equations, Applicable analysis.

Projects

- On extending the theory of discrete state Markov chain to continuous state Markov process and implementation of Metropolis-Hasting algorithm to calculate various complicated integrals.
- On the study of exponential families, Location and scale families in Statistics.
- Worked in a team of two on designing an algorithm that builds a prefix code for a given text using Matlab. Also, we managed to obtain a code with smallest average length.
- On estimation of mean squared error of optimal frames obtained via some defined procedure using programming tool (Matlab).

COMPUTER SKILLS

Proficient in Tex, LATEX, HTML, Microsoft office, Microsoft Windows XP/2000, and the fundamentals of LINUX, programming in MATLAB, Mathematica, R, FORTRAN 77.

References

1. Dr. Vern Paulsen, Professor at Department of Mathematics, University of Houston, Contact: Email: vern@math.uh.edu, Phone: (713) 743-3450.
2. Dr. Jeff Morgan, Chair, Department of Mathematics, University of Houston, Contact: Email: jmorgan@math.uh.edu, Phone: (713) 743-3455.
3. Dr. Scott McCullough, Professor at Department of Mathematics, University of Florida, Contact: Email: sam@math.ufl.edu, Phone: (352) 392-0281 x-258.
4. Dr. John Mackey, Associate Chair, Department of Mathematics, Carnegie Mellon University, Contact: Email: jmackey@andrew.cmu.edu, Phone: (412) 268-2545.