Naeem Nisar Sheikh

Contact Information

Dept. address:
Dept. of Mathematics, UIUC
1409 W. Green Street
Urbana, IL 61801
Tel.: 217.244.3968
E-mail: nsheikh@math.uiuc.edu
WWW: www.math.uiuc.edu/~nsheikh

Home address:
502 West Main St.
Apt. 202
Urbana, IL 61801
Tel.: 217.328.7703

Research Interests

Combinatorics. In particular, enumeration, graph theory, posets, discrete optimization.
Thesis topics: induced Ramsey theory, decompositions of planar graphs, enumeration of matchings, and intersection families.

Education

University of Illinois, Urbana-Champaign, Illinois USA

Ph.D. Candidate, Mathematics, Aug 2002 - current (expected graduation date: May 2008)

- Dissertation Topic: "Extremal problems for partitions of edge sets of graphs"
- Advisor: Alexandr V. Kostochka

M.S., Mathematics (specialization in Algorithms and Optimization), May 2002

University of Rochester, Rochester, New York USA

August 1997 - December 1997 and August 1999 - May 2000
Enrolled in the graduate program of department of Mathematics

University of Rochester, Rochester, New York USA

August 1996 - May 1997
One year of graduate coursework in the Computer Science department
Coursework: Operating Systems, Computational Complexity,
Parallel Algorithms, Artificial Intelligence

Hamilton College, Clinton, New York USA

B.A., Mathematics, May 1996

Honors and Recognition

UIUC: Have been awarded the Department of Mathematics TA Instructional Award in April 2008. This award is presented for exemplary teaching and selection is based on classroom observation, comments from students, and a written report by the nominees describing their teaching goals.

UIUC: Name included on the campus-wide List of Excellent Teachers eight times.

Hamilton College: Graduated Magna Cum Laude with rank of 29/399; Phi Beta Kappa (National Academic Honor Society) inductee

Hamilton College: Placed in top 500 out of about 2500 contestants in Putnam Examination in 1994 and 1995.

Teaching Experience at UIUC

Instructor **Aug 2000 - May 2008**

Taught (couple of times as discussion assistant, but rest of the times as instructor) a number of undergraduate mathematics courses at UIUC. Full list tabulated below. For other teaching-related experiences, please refer to the attached summary of teaching experiences.

Course number and name	*Teaching Role*	*Number of times*
MATH 220: Calculus I	Discussion Assistant	1
MATH 242: Multivariable Calculus	Discussion Assistant	1
MATH 242: Multivariable Calculus	Instructor	2
MATH 242: Multivariable Calc. w/ *Mathematica*	Instructor	4
MATH 213: Discrete Mathematics	Instructor	2
MATH 225: Linear Algebra	Instructor	1
MATH 220: Calculus I w/ *Mathematica*	Instructor	2
MATH 125: Linear Algebra for Business Students	Instructor	1
CS 105: Comp. Sci. for Non-technical majors	Lab Instructor	1
CS 273: Introduction to Algorithms	Grader	1
MATH 580: Graduate Intro. to Combinatorics	Grader	2
MATH 417: Algebra	Grader	1

GRE Instructor, Educational Equity Programs Office **May 2007 - Aug 2007**
Developed and conducted classes for undergraduate students from minorities within US who were doing research at UIUC over summer. The classes were for improving their performance on the quantitative (maths) section of GRE for their application to graduate school.

Programming Experience at UIUC

Programmer, National Center for Supercomputing Applications **Aug 2005 - Aug 2006**
Programmed on the Charm++ code-developing platform for parallelizing code written in C.

MATLAB Programmer, National Center for Supercomputing Applications **May 2004 - Aug 2004**
Wrote a program to compute the intensity in the acoustic field generated by a cylindrical probe for treating some diseases by hitting the diseased cells with strong sound waves.

Algorithm developer, National Center for Supercomputing Applications **Aug 2004 - Nov 2004**
Worked in a 3-person team to develop faster ways of checking Goldbach's Conjecture for a larger range of numbers than had been done up to that point. Team leader was a full-time employee at National Center for Supercomputing Applications, I was responsible for reading papers and coming up with new ideas for algorithms, and the third person of the team coded these in C.

MATLAB Programmer, Dept. of Speech and Hearing Sciences **May 2001 - Jan 2002**
Developed a graphic-interface program to automate collection of certain statistics from 4 different signal files for swallowing research.

Papers Published

Sheikh, N.N., and Kostochka, A.V. On the induced Ramsey number $\mathrm{IR}(P_3, H)$, Topics in discrete mathematics, 155–167, Algorithms Combin., 26, Springer, Berlin, 2006.

Sheikh, N.N, and Hwang, K.W. Intersection families and Snevily's conjecture. European J. of Combinatorics, 28 (2007), no. 3, 843–847.

Borodin, O.V., Ivanova, A.O., Kostochka, A.V., and Sheikh, N.N. Minimax Degrees of Quasiplane Graphs Without 4-cycles. Siberian Electronic Mathematical Reports, 4 (2007), 435-439.

Papers Accepted

Hwang, K.W., and Sheikh, N.N. A Note on Convex Subsets of $\mathbb{Z}^k$. Discrete Mathematics.

Hartke, S., Hwang, K.W., and Sheikh N.N. A Note on Divisibility of the Number of Matchings of a Family of Graphs. Electronic Journal of Combinatorics.

Borodin, O.V., Kostochka, A.V., Sheikh, N.N. and Yu, G. Decomposing a planar graph with girth

nine into a forest and a matching. European J. of Combinatorics.

Borodin, O.V., Ivanova, A.O., Kostochka, A.V., and Sheikh, N.N. Minimax degrees of quasiplanar graphs with no short cycles other than triangles. Taiwanese J. of Mathematics (special issue dedicated to Ko-Wei Lih).

Borodin, O.V., Ivanova, A.O., Kostochka, A.V., and Sheikh, N.N. Planar graphs decomposable into a forest and a matching. Discrete Mathematics.

Papers Submitted

Borodin, O.V., Kostochka, A.V., Sheikh, N.N. and Yu, G. M-degrees of quadrangle-free planar graphs. J. of Graph Theory.

Borodin, O.V., Ivanova, A.O., Kostochka, A.V., and Sheikh, N.N. Decompositions of quadrangle-free planar graphs. Discussiones Mathematicae Graph Theory.

Professional Experience

Hamilton College and Colgate University, New York USA

Technical Support Specialist **Dec 1997 - Aug 1999**

Worked with the language faculty and the information technology administrators of the two institutions in incorporation of technology into teaching of languages. The projects were funded by a Mellon Foundation grant. Duties included programming (JavaScript, HyperCard, Libra), media creation (movie digitization and compression, subtitling, images) and running teaching sessions for faculty members to become self-sufficient with the basic suite of teaching productivity software (image creation and manipulation, annotations, text and media linking, and interactive webpages).

Talks and Presentations

Induced Ramsey numbers, Dept. of Maths Combinatorics Seminar, April 1 2003, UIUC.

Intersection Families and the Polynomial Method, Dept. of Maths Graduate Student Research Seminar, November 3 2004, UIUC.

Induced Ramsey numbers of P_3 with other graphs, Dept. of Maths Combinatorics Seminar, January 25 2005, UIUC.

Induced Ramsey Numbers of P_3 with other graphs, Graduate Student Combinatorics Conference, April 16-17 2005, University of Minnesota, Minneapolis, Minnesota.

Induced Ramsey numbers of P_3 with other graphs, 43rd MIdwestern GrapH TheorY (MIGHTY) Conference, November 3-4 2006, Indiana-Purdue University, Fort Wayne, Indiana.

Divisibility by 3 of the Number of Matchings of a Family of Graphs; Convex Subsets of $\mathbb{Z}^k$; Dept. of Maths Combinatorics Seminar, November 28 2006, UIUC.

Edge-partitioning of planar graphs, Dept. of Maths Combinatorics Seminar, April 10 2007, UIUC.

Decomposing a planar graph into a forest and a matching, 3rd Annual Graduate Student Combinatorics Conference, April 21-22, University of Washington, Seattle, Washington.

Minimax degrees of quadrangle-free planar graphs, Dept. of Maths Combinatorics Seminar, September 25 2007, UIUC.

Combinatorial Proofs of Certain Identities in Ramanujan's Lost Notebook, Dept. of Maths Combinatorics Seminar, January 22 2008, UIUC.

Decompositions of planar graphs into a forest and another graph, 2008 Spring Central Section AMS Meeting, April 5-6, 2008, Indiana University, Bloomington, Indiana. *(invited talk)*

Divisibility by 3 of the number of matchings of a family of planar graphs, Mathematical Abundance: Designs, Graphs, and Number Theory – a conference honoring the 72nd birthday of Charles Vanden Eynden, April 18-19, 2008, Illinois State University, Normal, Illinois.

Computer Skills

- Languages: C++, C, Java, JavaScript, HyperTalk, SQL, LaTeX, HTML, CSS; some Python, some VisualBasic
- Specialized Programming Environments: Mathematica, MATLAB, and some Maple
- Productivity Suites: MS Office, OpenOffice
- Operating Systems: Unix/Linux, MacOS, Windows

Languages

Fluent in English, Arabic, Sindhi and Urdu. Beginner in Russian.

Personal Interests

Environmental issues, esp. recycling and re-using of resources; community organizing at grassroots level; social justice; biking; arts.