

PAPERS

The linear term of type-A Kazhdan-Lusztig polynomials

In preparation

I give the first general combinatorial interpretation for the coefficient of the linear term of a Kazhdan-Lusztig polynomial associated to two permutations.

The combinatorics of a three-line circulant determinant

(With N. Loehr, H. Wilf) Israel J. Math., To appear

We find the nonzero coefficients in the monomial expansion of a simple product formula.

Juggling probabilities

American Mathematical Monthly, To appear

The act of a person juggling can be viewed as a Markov process if we assume that the juggler throws to random heights. I make this association for the simplest reasonable model of random juggling and compute the steady state probabilities in terms of the Stirling numbers of the second kind. I also explore several alternate models of juggling.

Counterexamples to the 0-1 Conjecture

(With T. McLarnan) Rep. Theory, 7 (2003), 181–195

Let $\mu(x, w)$ denote the coefficient of highest possible degree in the Kazhdan-Lusztig polynomial associated to the permutations x and w in S_n . The 0-1 conjecture states that $\mu(x, w)$ is either 0 or 1. We present two counterexamples to this conjecture.

A formulae for inverse Kazhdan-Lusztig polynomials in S_n

J. Comb. Theory, Ser. A, 104, (2003), no. 2, 301–316

Let w_0 be the longest element in S_n . I compute the Kazhdan-Lusztig polynomial P_{ww_0, xw_0} for two cases in which x indexes an irreducible component of the singular locus of the Schubert variety X_w .

Maximal singular loci of Schubert varieties in $SL(n)/B$

(With S. Billey) Trans. of the AMS, 355 (2003), no. 10, 3915–3945

We give an explicit combinatorial description of the irreducible components of the singular locus of any Schubert variety indexed by a permutation.

Kazhdan-Lusztig polynomials for 321-hexagon-avoiding permutations

(With S. Billey) Journal of Algebraic Combinatorics, 13, (2001) 111–136

We determine that the Schubert varieties in $SL(n)/B$ for which the Bott-Samelson resolutions are small are indexed by 321-hexagon-avoiding permutations. Using results of Deodhar, this gives a combinatorial description of the Kazhdan-Lusztig polynomials associated to these varieties.

SERVICE

Math reviews reviewer

Referee for

FPSAC 2002

Discrete Mathematics

Experimental Mathematics

Journal of Algebraic Combinatorics

Journal of Combinatorial Theory, Series A

MEMBERSHIP

AMS, MAA, Sigma Xi

PERSONAL

US citizen

Married since August 1999

9-ball juggler; former world record holder in ball passing

(0,1,q)-Permutations	
Univ. Pennsylvania, Combinatorics Seminar	March 2004
Univ. Washington, Combinatorics Seminar	November 2003
Ribbon tableaux and Kazhdan-Lusztig polynomials	
Univ. Pennsylvania, Combinatorics Seminar	January 2004
An overview of Kazhdan-Lusztig polynomials	
Univ. Pennsylvania, Combinatorics Seminar	October 2003
Counterexamples to the 0-1 Conjecture	
Yale, Algebra Seminar	April 2004
MIT, Combined Lie Groups/Combinatorics Seminar	November 2002
CRM, Conference on Computational Lie Theory	June 2002
Juggling probabilities	
Yale Univ., Colloquium	April 2004
St. Joseph's, Math Awareness Day	April 2004
Worcester Polytechnic Institute, Colloquium	April 2003
St. Michael's College, Colloquium	March 2003
Mathematics of juggling (* – with A. Knutson)	
Univ. of Massachusetts, Colloquium*	October 2002
MIT Museum, Family Day	November 2001
Harvard Univ., Trivial Notions	November 2000
Haverford College, Colloquium*	March 1999
MIT, Applied Mathematics Colloquium*	March 1999
The Math Circle (weekend math program for precollege students)	December 1998
IAS/PCMI Representation Theory Summer Session*	July 1998
Towards pictures of Kazhdan-Lusztig polynomials	
Representation Theory Seminar	March 2003
SUNY Albany, Discrete Math Day	September 2002
Juggling and Markov chains	
Dartmouth College, Discrete Math Day	May 2002
Properties of Betti numbers of Schubert varieties	
AMS Special Session on Algebraic Combinatorics (Ann Arbor, MI)	March 2002
Maximal singular loci of Schubert varieties in $SL(n)/B$	
Univ. of Massachusetts, Representation Theory Seminar	November 2001
Univ. of Michigan, Combinatorics Seminar	November 2000
Kazhdan-Lusztig polynomials and 321-hexagon-avoiding permutations	
AMS Special Session in Honor of G.-C. Rota (Washington, DC)	January 2000
MIT, Combinatorics Seminar	November 1999