

Vita – David B. Jaffe

Address

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Education

PhD Mathematics University of California at Berkeley, 1987.
BS Mathematics } San Francisco State University, 1981. Summa Cum Laude.
BS Economics }

Employment

Associate Professor, University of Nebraska, Lincoln, 1994-
Assistant Professor, University of Nebraska, Lincoln, 1989-94
Research Assistant Professor, Purdue University, 1987-89
Teaching Assistant, University of California, Berkeley, 1981-86

Career goal: apply my mathematical and programming skills to bioinformatics

- ☼ Currently teaching “Algorithms in biological sequence analysis”
(<http://bigbox.unl.edu/bio/Bin>).
- ☼ Begin studying bioinformatics in late 1999.
- ☼ Designed a computer language `Split` for mechanically proving theorems about codes, via exact linear programming and other methods. I freely distribute the source code, about 35,000 lines of C++.
- ☼ Used coding theory to solve a problem in algebraic geometry, proving that a sextic surface cannot have 66 nodes.
- ☼ Through about 1996, my work was in pure mathematics (algebraic geometry).

Grants and Fellowships (group grants not listed)

- ☼ NSF Grant 880113 (postdoctoral associate under Craig Huneke), June 1, 1988 – May 31, 1990; \$140,303.
- ☼ UNL Research Council Summer Fellowship, 1991; \$5500.
- ☼ NSF Grant DMS-9100983, September 1, 1991 – February 28, 1994; \$33,100.
- ☼ UNL Research Council Grant-in-Aid, 1992; \$2500.
- ☼ NSF Grant DMS-9623205, July 1, 1996 – May 31, 1998; \$30,000 (plus REU Supplement for summer 1998, \$4000).
- ☼ UNL Research Council, Grant-in-Aid, 1998, \$3000.
- ☼ NSF Grant DMS-9801581, August 1, 1998 – July 31, 2001; \$55,669.

Recent talks

- ☼ Eindhoven (Netherlands), Seminar, June 1997, “Nonexistence of binary linear codes”
- ☼ Luminy (France), AGCT-6, June 1997, “A sextic surface in $\mathbb{C}P^3$ can have at most 65 nodes”
- ☼ Toulouse (France), AAEC 12, June 1997, “A brief tour of split linear programming”
- ☼ Portland, Maine, July 1997, Int. Conf. on Combinatorics, Info. Theory and Statistics, “How to show that binary linear codes do not exist”
- ☼ Notre Dame, Midwest Algebraic Geometry Conf., November 1997, “The Jacobian Conjecture for \mathbb{C}^2 as a problem about divisors on rational surfaces, and graphs associated to them”
- ☼ Sozopol (Bulgaria), Second Int. Workshop on Optimal Codes and Related Topics, “Looking inside codes” and “Split – a language for investigating binary linear codes”, June 1998.
- ☼ Boston, Int. Symposium on Information Theory, “Optimal binary linear codes of length ≤ 30 ”, August 1998.
- ☼ Chicago, AMS Special Session in Algebraic Coding Theory, “Optimal binary linear codes obtained from regular partitions of vector spaces”, September 1998.
- ☼ Piscataway, New Jersey, DIMACS Workshop on Codes and Association Schemes, “Linear programming bounds on codes of length 1000”, November 1999.

Web sites

- ☼ Home page: <http://www.math.unl.edu/~djaffe>
(with links near the top to the following other sites)
- ☼ Codes database (research): <http://bigbox.unl.edu/codeform>
(a convenient interface to the data produced by my program `Split`)
- ☼ Bioinformatics course (pedagogical, under development): <http://bigbox.unl.edu/bio/Bin>
- ☼ High school geometry (pedagogical): http://bigbox.unl.edu/plane/bin/index_a.htm

Publications

(on joint papers, the authors' names appear alphabetically on the publication)

- [1] (with A. Barg) Numerical results on the asymptotic rate of binary codes, submitted for publication.
- [2] (with I. Bouyouklev and V. Vavrek) The smallest length of eight-dimensional binary linear codes with prescribed minimum distance, to appear in *IEEE Transactions on Information Theory*.
- [3] (with I. Bouyouklev) Optimal binary linear codes of dimension at most seven, to appear in *Discrete Mathematics*.
- [4] Binary linear codes: new results on nonexistence, preprint (ongoing work), Version 0.6beta (3/21/2000), accessible over the World Wide Web via <http://www.math.unl.edu/~djaffe/codes/code.ps.gz> or [code.dvi.gz](http://www.math.unl.edu/~djaffe/codes/code.dvi.gz); see <http://www.math.unl.edu/~djaffe/binary/codeform.html> for an online database, which is more frequently updated.
- [5] (with J. Simonis) New binary linear codes which are dual transforms of good codes, *IEEE Transactions on Information Theory* **45** (1999), 2136–2137.
- [6] Optimal binary linear codes of length ≤ 30 , *Discrete Mathematics*, to appear.
- [7] Looking inside codes, *Proceedings of the Second International Workshop on Optimal Codes and Related Topics* (Sozopol, Bulgaria, June 9-15, 1998), Institute of Mathematics and Informatics (Sofia), 1998, pp. 137–143.
- [8] (with V. D. Tonchev) Computing linear codes and unitals, *Designs, Codes, and Cryptography* **14** (1998), 39–52.
- [9] A brief tour of split linear programming (Proc. AAEECC 12, ed. T. Mora, H. Mattson), *Lecture Notes in Computer Science* **1255**, Springer-Verlag, 1997, 164–173.
- [10] (with D. Ruberman) A sextic surface cannot have 66 nodes, *Journal of Algebraic Geometry* **6** (1997), 151–168.
- [11] Coherent functors, with application to torsion in the Picard group, *Transactions of the American Mathematical Society* **349** (1997), 481–527.

- [12] (with R. Guralnick, W. Raskind, R. Wiegand) On the Picard group: torsion and the kernel induced by a faithfully flat map, *J. Algebra* **183** (1996), 420–455.
- [13] Functorial structure of units in a tensor product, *Transactions of the American Mathematical Society* **348** (1996), 4339–4353.
- [14] Applications of iterated curve blowup to set theoretic complete intersections in \mathbb{P}^3 , *Journal für die reine und angewandte Mathematik* **464** (1995), 1–45.
- [15] Extensions of étale by connected group spaces, *Transactions of the American Mathematical Society* **335** (1993), 155–173.
- [16] Local geometry of smooth curves passing through rational double points, *Mathematische Annalen* **294** (1992), 645–660.
- [17] Smooth curves on a cone which pass through its vertex, *Manuscripta Mathematica* **73** (1991), 187–205.
- [18] On sections of commutative group schemes, *Compositio Mathematica* **80** (1991), 171–196.
- [19] (with D. Arapura) On Kodaira vanishing for singular varieties, *Proceedings of the American Mathematical Society* **105** (1989), 911–916.
- [20] On set theoretic complete intersections in \mathbb{P}^3 , *Mathematische Annalen* **285** (1989), 165–176.
- [21] Relative representability of group scheme sections, *American Journal of Mathematics* **112** (1989), 461–479.
- [22] Space curves which are the intersection of a cone with another surface, *Duke Mathematics Journal* **57** (1988), 859–876.