

David F. Gleich

74 Barnes Ct. #100
Stanford, CA 94305

801-949-0331
604-827-5534

dfgleic@sandia.gov

AWARDS

Intel Award of Excellence in Computer Science · Lourdes High School · 1998
us Army Excellence in Computer Science · Lourdes High School · 1998
High school valedictorian · Lourdes High School · 2000
Borrelli Prize · Harvey Mudd College · 2003
Honors in Computer Science · Harvey Mudd College · 2004
High distinction · Harvey Mudd College · 2004
National Science Foundation Graduation Fellowship, Honorable Mention · Harvey Mudd College · 2004
Best speaker · SCREAM 2005 · 2005
Microsoft Live Labs Fellowship · 2007
Department of Energy John von Neumann Postdoctoral Fellowship · 2010

EDUCATION

Lourdes High School · Rochester, MN · 2000
University of Minnesota · UMTYMP · 1997-2000
Harvey Mudd College · Mathematics and Computer Science BS · 2004
Stanford University · Computational and Mathematical Engineering, MS · 2006
Stanford University · Computational and Mathematical Engineering, PHD · 2009

EXPERIENCE

1996 (Sum.) *Computer Day Camp Instructor · PC Discovery · Rochester, MN*
1997 (Sum.) *Computer Day Camp Instructor · PC Discovery · Rochester, MN*
1998 (Sum.) *Computer Programmer · Mayo Clinic · Rochester, MN*
2000 (Spr.) *Volunteer Computer Support · St. Johns Elemanry School · Rochester, MN*
2000 (Sum.) *Computer Programmer/Analyst · Mayo Clinic · Rochester, MN*
2001 (Sum.) *Software Design Engineer in Test Intern · Microsoft Corporation · Redmond, WA*
2002 (Sum.) *Software Design Engineer Intern · Microsoft Corporation · Redmond, WA*
2003 (Sum.) *Research and Development Intern · Overture Research · Pasadena, CA*
2003-2004 *Research and Development Intern · Yahoo! Research Labs · Pasadena, CA*
2004-2005 *Part-Time Research Associate · Yahoo! · Sunnyvale, CA · Leonid Zhukov*
2005 (Sum.) *Research Intern with Applications Research Lab · Intel Corporation · Santa Clara, CA*
2005-2006 *Part-Time Research Associate · Yahoo! · Sunnyvale, CA · Leonid Zhukov*
2006 *Research Assistant · Stanford University · Amin Saberi*
2006-2007 *Research Assistant · Stanford University · Gene Golub*
2007 (Sum.) *CADS Intern · Stanford University · Margot Gerritsen, Amin Saberi*
2007-2009 *Flixbee Inc. · Palo Alto, CA*

2007-2009 *Research Assitant · Stanford University · Michael Saunders*

2008 (Sum.) *Research Intern · Microsoft Live Labs · Redmond, WA*

2009-2010 *Post-doctoral Fellow · University of British Columbia*

2010- *John von Neumann Research Fellow · Sandia National Labs · Livermore, CA*

TEACHING ASSISTANTSHIPS

2004 (Fall) *Linear Algebra with Applications to Engineering Computations · Margot Gerritsen*

2005 (Win.) *Matrix Computations with Applications to Data Mining and IT · Gene Golub*

2005 (Fall) *Linear Algebra with Applications to Engineering Computations · Margot Gerritsen*

PUBLICATIONS

JOURNAL ARTICLES

David F. Gleich and Marzia Polito. Approximating personalized PageRank with minimal use of webgraph data. *Internet Mathematics*, 3(3):257–294, December 2007. doi : 10.1007/978-3-540-77004-6_2

Qiqi Wang, David F. Gleich, Amin Saberi, Nasrollah Etemadi, and Parviz Moin. A Monte Carlo method for solving unsteady adjoint equations. *Journal of Computational Physics*, 227(12):6184–6205, June 2008. ISSN 0021-9991. doi : 10.1007/978-3-540-77004-6_2

Paul G. Constantine, David F. Gleich, and Gianluca Iaccarino. Spectral methods for parameterized matrix equations. *SIAM Journal on Matrix Analysis and Applications*, 31(5):2681–2699, 2010. doi : 10.1007/978-3-540-77004-6_2

David F. Gleich, Andrew P. Gray, Chen Greif, and Tracy Lau. An inner-outer iteration for PageRank. *SIAM Journal of Scientific Computing*, 32(1):349–371, February 2010b. doi : 10.1007/978-3-540-77004-6_2 (Includes all software.)

Paul G. Constantine and David F. Gleich. Random alpha pagerank. *Internet Mathematics*, 6(2):189–236, September 2010. doi : 10.1007/978-3-540-77004-6_2. URL <http://projecteuclid.org/DPubS?service=UI&version=1.0&verb=Display&handle=euclid.im/1285339073> (Includes all software.)

David F. Gleich, Ying Wang, Xiangrui Meng, Farnaz Ronaghi, Margot Gerritsen, and Amin Saberi. Some computational tools for digital archive and metadata maintenance. *BIT Numerical Mathematics*, 51:127–154, 2011b. ISSN 0006-3835. doi : 10.1007/978-3-540-77004-6_2. 10.1007/s10543-011-0324-6

Paul G. Constantine, David F. Gleich, and Gianluca Iaccarino. A factorization of the spectral Galerkin system for parameterized matrix equations: derivation and applications. *SIAM Journal of Scientific Computing*, In press. URL <http://arxiv.org/abs/1006.3053>. Preprint arXiv:1006.3053 (Includes all software.)

Francesco Bonchi, David F. Gleich, Chen Greif, and Laks V. S. Lakshmanan. Fast matrix computations for pair-wise and column-wise commute times and katz scores. *Internet Mathematics*, To appear., 2011. URL <http://arxiv.org/abs/1104.3791> (Includes all software.)

REFERRED CONFERENCE PUBLICATIONS

David F. Gleich and Leonid Zhukov. An SVD based term suggestion and ranking system. In *ICDM '04: Proceedings of the Fourth IEEE International Conference on Data Mining (ICDM'04)*, pages 391–394, Brighton, UK, November 2004. IEEE Computer Society. ISBN 0-7695-2142-8. doi : 10.1007/978-3-540-77004-6_2

Dennis Decoste, David F. Gleich, Tejaswi Kasturi, Sathiya Keerthi, Omid Madani, Seung-Taek Park, David M. Pennock, Corey Porter, Sumit Sanghai, Farial Shahnaz, and Leonid Zhukov. Recommender systems

research at Yahoo! Research Labs. In *Beyond Personalization*, San Diego, CA, January 2005. Position Statement

Paul G. Constantine and David F. Gleich. Using polynomial chaos to compute the influence of multiple random surfers in the PageRank model. In Anthony Bonato and Fan Chung Graham, editors, *Proceedings of the 5th Workshop on Algorithms and Models for the Web Graph (WAW2007)*, volume 4863 of *Lecture Notes in Computer Science*, pages 82–95. Springer, 2007. doi : 10.1007/978-3-540-77004-6_2

Mohsen Bayati, Margot Gerritsen, David F. Gleich, Amin Saberi, and Ying Wang. Algorithms for large, sparse network alignment problems. In *Proceedings of the 9th IEEE International Conference on Data Mining*, pages 705–710, December 2009. doi : 10.1007/978-3-540-77004-6_2 (Includes all software.)

David F. Gleich, Paul G. Constantine, Abraham Flaxman, and Asela Gunawardana. Tracking the random surfer: empirically measured teleportation parameters in PageRank. In *WWW '10: Proceedings of the 19th international conference on World wide web*, pages 381–390, April 2010a. ISBN 978-1-60558-799-8. doi : 10.1007/978-3-540-77004-6_2

Pooya Esfandiari, Francesco Bonchi, David F. Gleich, Chen Greif, Laks V. S. Lakshmanan, and Byung-Won On. Fast katz and commuters: Efficient approximation of social relatedness over large networks. In *Algorithms and Models for the Web Graph*, 2010. doi : 10.1007/978-3-540-77004-6_2 (Includes all software.)

Paul G. Constantine and David F. Gleich. Tall and skinny qr factorizations in mapreduce architectures. In *Proceedings of the second international workshop on MapReduce and its applications*, MapReduce '11, pages 43–50, New York, NY, USA, 2011. ACM. ISBN 978-1-4503-0700-0. doi : 10.1007/978-3-540-77004-6_2 (Includes all software.)

David F. Gleich and Lek-Heng Lim. Rank aggregation via nuclear norm minimization. In *Proceedings of the ACM Special Interest Group on Knowledge Discovery and Data (KDD '11)*, 2011. URL <http://arxiv.org/abs/1102.4821> (Includes all software.)

CONFERENCE PUBLICATIONS

David F. Gleich, Peter Glynn, Gene H. Golub, and Chen Greif. Three results on the PageRank vector: eigenstructure, sensitivity, and the derivative. In Andreas Frommer, Michael W. Mahoney, and Daniel B. Szyld, editors, *Web Information Retrieval and Linear Algebra Algorithms*, number 07071 in Dagstuhl Seminar Proceedings. Internationales Begegnungs- und Forschungszentrum fuer Informatik (IBFI), Schloss Dagstuhl, Germany, 2007. URL <http://drops.dagstuhl.de/opus/volltexte/2007/1061>

POSTERS

David F. Gleich and Leonid Zhukov. Scalable computing with power-law graphs: Experience with parallel PageRank. In *SuperComputing 2005*, November 2005. URL <http://www.stanford.edu/~dgleich/publications/gleich-zhukov-sc-pprank-abstract.pdf>.
Poster

David F. Gleich, Leonid Zhukov, Matthew Rasmussen, and Kevin Lang. The World of Music: SDP embedding of high dimensional data. In *Information Visualization 2005*, 2005. Interactive Poster

David F. Gleich, Reid Andersen, and Vahab S. Mirrokni. Overlapping clusters for distributed computation. Poster at SIAM Combinatorial Scientific Computing conference (CSC2011), May 2011a

TECHNICAL REPORTS

Erin Bodine, David F. Gleich, Cathy Kurata, Jordan Kwan, Lesley Ward, and Daniel Fain. Three methods for improving relevance in web search. Clinic Report, Harvey Mudd College, May 9 2003. 102 pages. Includes fully documented program code on accompanying CD

David F. Gleich, Leonid Zhukov, and Pavel Berkhin. Fast parallel PageRank: A linear system approach. Technical Report YRL-2004-038, Yahoo! Research Labs, 2004. URL <http://stanford.edu/~dgleich/publications/prlinear-dgleich.pdf>

PREPRINTS

Reid Andersen, David F. Gleich, and Vahab S. Mirrokni. Overlapping clusters for distributed computation. Submitted for review (Includes all software.)

Pooya Esfandiari, Mohammad Khabbazi, David F. Gleich, and Laks V. S. Lakshmanan. Evaluating graph based proximity search for a recommender system with item tags. In preparation., 2011

David F. Gleich, Chen Greif, and James M. Varah. The power and arnoldi methods in an algebra of circulants. Submitted. Preprint arXiv:1101.2173. URL <http://arxiv.org/abs/1101.2173>. (Includes all software) (Includes all software.)

David F. Gleich and Art B. Owen. Moment based estimation of stochastic kronecker graph parameters. *arXiv*, stat.ML:1106.1674, 2011. URL <http://arxiv.org/abs/1106.1674> (Includes all software.)

Mohsen Bayati, David F. Gleich, Amin Saberi, and Ying Wang. Message passing algorithms for sparse network alignment. Submitted, 2011 (Includes all software.)

CONFERENCE ORGANIZATION

(With Andreas Argyriou, Tamara G. Kolda, Vicente Malave, Marco Signoretto, Johan Suykens) *Workshop on Tensors, Kernels, and Machine Learning* · NIPS 2010.

(With Amy Langville.) *Mini-Symposium on Matrix Methods for Sparse Text and Data Mining* · SIAM Annual Meeting 2008. SPEAKERS David F. Gleich (Random parameters in PageRank) · Michael Saunders (Basis Pursuit for Sparse Personalized PageRank vectors) · Yehuda Koren (Matrix Methods in the NetFlix competition) · Brett W. Bader (Methods for Multilingual Text Analysis)

Symposium on current research in engineering and applied mathematics (SCREAM 2007) · Stanford University · Organized by the SIAM Student Chapter

OTHER CONTRIBUTIONS

SOFTWARE

MatlabBGL · Version 4.0 · 2006-2008

vismatrix · Version 2 · 2005-2009

gaimc · Version 1.0 · 2008-2009

bisquik · Version 1.0 · 2011

PATENTS

Methods for Ranking Graphs using Random Parameters, with Paul Constantine. Pending.

REFERRING

SIAM Journal of Matrix Analysis and its Applications · SIAM Journal on Scientific Computing · Information Visualization Conference · SIAM Symposium on Discrete Algorithms · Transactions on Parallel and Distributed Computing · Mathematics of Computation · Physics Review Letters · Mathematics and Computation · Physics Review E · Transactions on Knowledge and Data Engineering · Communications of the ACM · Information Retrieval · Linear Algebra and its applications · Electronic Transactions on Numerical Analysis

INTERVIEWS

Richard Giles. *How to Use Flickr*. Course Technology PTR, 2006. Interview about visualizations of the Flickr social network.

“A Visual Exploration of Complex Networks.” Seed Magazine Online, 24 July 2006. Accessed via http://www.seedmagazine.com/news/2006/07/look_around_you.php. Interview about visualizations of the LAUNCHcast recommendation network.

SKILLS

C/C++ · C# · Perl · PHP · Java · SQL · HTML · Linux · LaTeX · Matlab · MPI · Python · R · git