

James P. Vogel

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EDUCATION**PhD in Applied Mathematics**

Purdue University, May 2018 (expected)
Thesis: (title TBD)
PhD Advisor: Jianlin Xia

BS in Physics

University of Michigan, May 2013

RESEARCH INTERESTS

numerical linear algebra, optimization

EMPLOYMENT

Research Assistant, Purdue University Department of Mathematics (2013 - present)

Intern, Sandia National Laboratory, Computational Structural Dynamics (Summer 2016)

Teaching Assistant, University of Michigan Department of Mathematics (2011 - 2013)

AWARDS / PRIZES

[1] "SIAM Student Travel Award," (\$650) to the SIAM Meeting on Computational Science and Engineering, February 27 - March 3, 2017, Atlanta, GA

[2] "Outstanding presentation competition- 2nd place," SIAM-Purdue Student CS&E Conference, West Lafayette, IN, April 8, 2016

[3] "SIAM Student Travel Award," (\$859) to the SIAM Meeting on Applied Linear Algebra, October 26-30, 2015, Atlanta, GA

[4] "Outstanding presentation competition- honorable mention," Young Mathematicians Conference, July 27- July 29, 2012, Columbus, OH

PAPERS

[1] "A superfast divide-and-conquer method and approximation accuracy for structured eigenvalue decompositions," with J. Xia, S. Cauley, and V. Balakrishnan, *SIAM Journal on Scientific Computing*, 38 (2016), pp. A1358-A1382.

Preprints

- [2] “Superfast divide-and-conquer for eigenvalue solutions: revisited,” with J. Xia, Z. Xin, S. Cauley, and V. Balakrishnan.
- [3] “A Superfast multi-rank update for the symmetric eigenvalue problem,” with J. Xia.
- [4] “Superfast and stable norm minimization algorithms,” with J. Xia, S. Cauley, and V. Balakrishnan.

TALKS

Invited Presentations

- [1] “A Superfast Multi-Rank Eigenvalue Update: Algorithm, Analysis, and Applications,” at the Meeting of the International Linear Algebra Society, Ames, IA, July 24-28, 2017.
- [2] “Accelerating Parallel Optimization Methods with Hierarchical Matrix Computations,” at the SIAM CS&E Conference Conference, Atlanta, GA, February 27 - March 3, 2017.
- [3] “A Superfast Multi-Rank Eigenvalue Update: Algorithm, Analysis, and Applications,” (July 11, 2016), at the SIAM Annual Meeting Boston, MA, July 11-15, 2016
- [4] “Near-Linear Time Eigendecomposition and SVD Algorithms.” (October 30, 2015), at the SIAM Conference on Applied Linear Algebra, Atlanta, GA, October 26 - October 30, 2015
- [5] “Superfast Divide-and-Conquer Eigensolvers.” (October 4, 2015), at the AMS Midwest Sectional Meeting Fall 2015, Chicago, IL, October 2 - October 4, 2015
- [6] “Superfast Divide-and-Conquer Eigensolvers.” (August 29, 2015), at Mathematical Foundations for Fast Multi-Resolution Interactions and Analysis, Durham, NC, August 28 - August 29, 2015
- [7] “A Superfast Divide-and-Conquer Algorithm for Structured Eigenvalue Solutions.” (July 9, 2014), at the SIAM Annual Meeting, Chicago, IL, July 7 - July 11, 2014

Contributed Talks

- [8] “A Fast Multi-Rank Update to the Symmetric Eigenvalue Problem.” (April 23, 2016), at Midwest Numerical Analysis Day, La Crosse, WI, April 23, 2016
- [9] “A Fast Multi-Rank Update to the Symmetric Eigenvalue Problem.” (April 8, 2016), at SIAM-Purdue Student CS&E Conference, West Lafayette, IN, April 8, 2016
- [10] “Challenging Eigenvalue Problems” (November 14, 2015), at Purdue Mathematics Graduate Student Research Day.” West Lafayette, IN
- [11] “A Near-Linear Complexity SVD Algorithm.” (April 25, 2015), at Midwest Numerical Analysis Day, Dayton, OH, April 25, 2015
- [12] “A Near-Linear Complexity SVD Algorithm.” (November 22, 2014), at Purdue University Graduate Student Research Day, West Lafayette, IN
- [13] “A Superfast Divide-and-Conquer Algorithm for Structured Eigenvalue Solutions.” (May 3, 2014), at Midwest Numerical Analysis Day, Milwaukee, WI, May 3, 2014
- [14] “The Damped Navier-Stokes Equation for Image inpainting.” (July 29, 2012), at the Young Mathematicians Conference, Columbus, OH, July 27- July 29, 2012

Local Seminars

- [15] “The Damped Navier-Stokes Equation for Image Inpainting.” (June 27, 2012)
at the University of Michigan Math REU Symposium, Ann Arbor, MI
- [16] “A Superfast Multi-Rank Update to the Symmetric Eigenvalue Problem” (March 8, 2017),
at Purdue Numerical Linear Algebra Student Seminar (PUNLAG), West Lafayette, IN,
- [17] “Chordal Graph Theory and Semidefinite Optimization” (February 15, 2017),
at Purdue University Department of Mathematics Student Colloq., West Lafayette, IN
- [18] “A Mathematician’s Introduction to Quantum Computing” (August 31, 2016),
at Purdue University Department of Mathematics Student Colloq., West Lafayette, IN
- [19] “Superfast Divide-and-Conquer Eigensolvers” (June 21, 2016),
Sandia Seminar, Albuquerque, NM
- [20] “An Introduction to Randomized Linear Algebra” (November 2, 2015),
at Purdue University Department of Mathematics Student Colloq., West Lafayette, IN
- [21] “Superfast Divide-and-Conquer Eigensolvers.” (September 11, 2015),
at Purdue University Center for Computational and Applied Mathematics (CCAM)
Lunch Seminar, West Lafayette, IN
- [22] “A Friendly Introduction to Numerical Optimization.” (August 31, 2015),
at Purdue University Department of Mathematics Student Colloq., West Lafayette, IN
- [23] “Fast Solvers for the HSS Eigenvalue Problem.” (February 23, 2015),
at Purdue Numerical Linear Algebra Student Seminar (PUNLAG), West Lafayette, IN,
- [24] “Fast Solvers for HSS Linear Systems.” (February 16, 2015),
at Purdue Numerical Linear Algebra Student Seminar (PUNLAG), West Lafayette, IN,
- [25] “An Introduction to Rank Structured Matrices.” (February 9, 2015),
at Purdue Numerical Linear Algebra Student Seminar (PUNLAG), West Lafayette, IN,
- [26] “How Eigenvalues are Actually Computed.” (December 3, 2014),
at Purdue University Department of Mathematics Student Colloq., West Lafayette, IN
- [27] “HSS Matrices and the Rank-Structured Eigenvalue Problem.” (April 23, 2014),
at Purdue Numerical Linear Algebra Student Seminar (PUNLAG), West Lafayette, IN

WORKSHOPS ATTENDED

- [1] Workshop on Fast Direct Solvers, November 12-13, 2016, West Lafayette, IN
- [2] D-Wave Quantum Computing Tutorial, June 9, 2016, Los Alamos, NM
- [3] Parametrized Reduced Order Modeling Workshop, June 1-2, 2016, Albuquerque, NM
- [4] SIAM G^2S^3 Randomization in Numerical Lin. Alg., June 15 - June 26, 2015. Delphi, Greece
- [5] CBMS-NSF Fast Direct Solvers for Elliptic PDEs. June 23 - June 29, 2014. Hannover, NH

JOURNAL REFEREE ACTIVITY

Computational Optimization and Applications (Springer)

LEADERSHIP/ORGANIZATIONAL DUTIES

Society of Industrial and Applied Mathematics

- [1] Vice President, Purdue Student Chapter of SIAM, (2016-2017)
Organizer for SIAM-Purdue Student CS&E Conference, April 14, 2017
Organizer for SIAM-Purdue Linear Algebra Activity Group, 2016-2017
- [2] Mini-symposium organizer, "Structured Matrices and Applications," SIAM Conference on Applied Linear Algebra, Atlanta, GA, October 26 - October 30, 2015,
co-organized with Haizhao Yang
- [3] Session chair, "Imaging Science," SIAM Annual Meeting, Boston, MA, July 11-16, 2016

International Linear Algebra Society

- [4] Mini-symposium organizer, "Recent Advancements in Numerical Methods for Eigenvalue Computation," Meeting of the International Linear Algebra Society, Ames, IA, July 24-28, 2017, co-organized with Xin Ye

Purdue Math Department

- [5] Graduate Student Representative, Purdue University Dept. of Mathematics, (2015-2016)
Planned and led first year PhD student orientation week
Planned and led prospective PhD student visit weekend
Organized several social events for PhD students (oversaw budget of \$4000)
Led bi-annual town halls and reported student comments and complaints to administration
Oversaw nominations and voting for bi-annual student-invited speaker lecture series
- [6] Seminar organizer, "Student Colloquium," Purdue University Department of Mathematics,
Fall 2016 Semester, organizer
Spring 2016 Semester, co-organized with Alejandra Gaitan
Fall 2015 Semester, co-organized with Ellen Weld
Spring 2017 Semester, co-organized with Ellen Weld
- [7] Seminar organizer, "Bridge to Research," Purdue University Department of Mathematics,
Spring 2016 Semester, co-organized with Ellen Weld
- [8] Event organizer, "Graduate Student Research Day," Purdue University Department of Mathematics, November 21, 2015

Purdue Graduate Student Government (PGSG)

- [9] Treasurer, Purdue Graduate Student Government, (2017-2018)
Oversaw budget of over \$300,000
Made recommendations on budget re-allocations to senate
Handled all reimbursements and disbursements of funds
- [10] Senator, Purdue Graduate Student Government, representing Math Dept., (2016-2017)
- [11] Clerk, Purdue Graduate Student Government (2016-2017)
- [12] Purdue Graduate Student Government Grant Review and Allocation Committee (GRAC)
Committee vice-chair (2016-2017)
Committee member (2016-2017)
- [13] Grade Appeal Committee Member (2016-2017)

MEMBERSHIPS

American Mathematical Society (AMS)

International Linear Algebra Society (ILAS)

Society for Industrial and Applied Mathematics (SIAM)

COMPUTER PROGRAMMING

C, C++, Fortran, Matlab, MPI, Open MP, Python

LANGUAGES

Fluent: English, Spanish

Translation Only: French, Latin

PLACE OF BIRTH

San Diego, CA, USA, 1991