James C. Hateley IV

Vanderbilt University
Department of Mathematics
1326 Stevenson Center 1222
Nashville, TN 37240

Fax: (615) 343-0215
Email: james.c.hateley@vanderbilt.edu
Homepage: http://jchateley.com

Education

Ph.D. Mathematics, University of California, Santa Barbara 2019.

M.S. Mathematics, University of California, Irvine 2010.

B.S. Mathematics, University of California, Irvine 2008.
With Honors in Mathematics

Research Interests

General: Computational Partial Differential Equations, Computational Physics

Specific: Asymptotic Analysis, semiclassical methods, Galerkin methods

Research Statement Summary

Solving computational partial differential equations and applications there of; more specifically, using asymptotic, numerical and functional analysis to develop efficient algorithms for solving problems for scientific computing in various fields such as computational physics, machine learning and inverse problems.

Publications

L. Chai, J. C. Hateley, E. Lorin and X. Yang. Convergence of Frozen Gaussian Approximation for Non-Strictly Hyperbolic Systems. (Preprint)

J. C. Hateley and X. Yang. Convergence of Frozen Gaussian Approximation for Elastic Waves. (Preprint)

J. C. Hateley, J. Roberts, K. Mylonakis and X. Yang. Deep Learning Seismic Substructure Detection using the Frozen Gaussian Approximation. (Submitted).
Preprint. http://arxiv.org/abs/1810.06610, 2019

J. C. Hateley, L. Chai, P. Tong, X. Yang. Frozen Gaussian approximation for 3-D Elastic Wave Equation and Seismic Tomography. Geophys. J. Int. Volume 216, Issue 2, February 2019, Pages 1394–1412, https://doi.org/10.1093/gji/ggy498

J. C. Hateley, H. Wei and L. Chen. Fast Methods for Computing Centroidal Voronoi Tessellations. Journal of Scientific Computing, 2014, (DOI) 10.1007/s10915-014-9894-1.

Academic Experience

Teaching Associate, University of California, Santa Barbara, Summer (2014, 2015, 2016, 2017).

Teaching Assistant, University of California, Santa Barbara, 2013-Present.

Adjunct Professor of Mathematics, Irvine Valley College, Irvine, 2011-2013.

Teaching Assistant, University of California, Irvine, 2008-2011.

Advisors and Mentors

Advisor of master degree: Professor Long Chen, UC Irvine

Advisor of doctoral degree thesis: Professor Xu Yang, UC Santa Barbara

Lectures

Frozen Gaussian Approximation and applications to seismology, SIAM seminar, UC Santa Barbara, 2018.

Frozen Gaussian Approximation for the Elastic Wave Equation, SOCAMS, UC Irvine, 2017.

Frozen Gaussian Approximation for siesmic imaging, SIAM seminar, UC Santa Barbara, 2016.

Fast Computation for Computing Centroidal Voronoi Tessellations, Graduate SIAM seminar, UC Santa Barbara, 2014.

Local Fourier analysis on the smoothing operator for multigrid methods, UC Irvine, 2011.

An introduction to Parallel Patterns for Parallel Computing, UC Irvine, 2011.

An overview of static Hamilton-Jacobi equations, UC Irvine, 2010.

A Review of Rational Tangles, UC Irvine, 2008.

Software

Fortran With MPI - Frozen Gaussian Approximation for the Elastic Wave Equation in 3D for rectangular domains, developed for a publication.
https://bitbucket.org/jhateley/fga_elastic_wave_3d

MatLab - Preconditioned optimization methods for computing 2D Centroidal Voronoi Tessellations, developed for a publication.
https://bitbucket.org/jhateley/cvt-2d

Teaching Experience

Teaching Associate, University of California, Santa Barbara
Vector Calculus, Summer 2014, 2015, 2016, 2017.

Teaching Assistant, University of California, Santa Barbara
Numerical Analysis, Spring 2019. Numerical Analysis, Winter 2019. Numerical Analysis, Fall 2018. Vector Calculus, Spring 2018. Multi-variable Calculus, Winter 2018. Multi-variable Calculus, Fall 2017. Vector Calculus, Spring 2017. Vector Calculus, Winter 2017. Integral Calculus, Fall 2016. Vector Calculus, Spring 2016. Multi-variable, Winter 2016. Vector Calculus, Fall 2015. Vector Calculus, Spring 2015. Multi-variable Winter 2015. Differential Calculus, Fall 2014. Multi-variable Calculus, Spring 2014. Vector Calculus, Winter 2014. Integral Calculus, Fall 2013.

Adjunct Professor of Mathematics, Irvine Valley College, Irvine
Business Calculus, Spring 2013. Pre-calculus, Fall 2012. Statistics, Summer 2012. Pre-calculus, Spring 2012. College Algebra, Fall 2011.

Teaching Assistant, University of California, Irvine
Vector Calculus, Summer 2011. Partial Differential Equations, Spring 2011. Differential Geometry. Spring 2011. Complex Analysis, Winter 2011. Linear Algebra, Winter 2011. Multivariable Analysis, Fall 2010. Theory of Differential Equations, Fall 2010. Vector Calculus, Summer 2009. Integral Calculus, Summer 2009. Multivariable Calculus, Spring 2009. Differential Calculus, Winter 2009. Integral Calculus, Fall 2008.

Conferences Attended

Presenter at Approximation Theory 16, March 2019, Vanderbilt University, Nashville, Tennessee.

Society of Exploration Geophysicists (SEG) annual meeting, October 14-19 2018, Anaheim, California.

Presenter at Southern California Applied Mathematics Symposium (SOCAMS), June 3 2017, UC Irvine, Irvine, California

Volunteer at Mean-field modeling and multiscale methods for complex physical and biological systems, October 31 - November 3, 2016 , UC Santa Barbara

Geometry and Its Applications - A Conference in Honor of the 80th Birthday of Richard S. Palais, May 12 - May 13, 2011, UC Irvine, Irvine, California

20th International Conference on Domain Decomposition Methods, February 7 - February 11, 2011, UC San Diego, La Jolla, California.

Awards, Honors

Department of Mathematics Graduate student teaching award at University of California, Santa Barbara. (2018)

Graduate summer fellowship of Department of Mathematics at University of California, Santa Barbara. (2017, 2018)

UC Irvine Academic Senate Council on Research, Computing and Libraries (CORCL) award (2010,2011)

Dean's Honor List at University of California, Irvine (2006, 2007, 2008)