Blake Hunter | Assistant Professor
Claremont McKenna College

Mathematical Sciences, 850 Columbia Ave., Claremont CA, 91711

Contact Information

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Research Interests

My research is in Data Mining and High Dimensional Data Analysis using Numerical Linear Algebra, focusing on Topic Modeling, Deep Learning, Spectral Methods, Image Processing, Applied Harmonic Analysis, and Random Processes.

Education

PhD in **Applied Mathematics**
University of California, Davis, June 2011
Dissertation Title: *Data mining compressed, incomplete and inaccurate high dimensional data.*
Advisor: T. Strohmer.

MS in **Mathematics**
California State Polytechnic University, Pomona, Sept. 2005
Thesis Title: *Gambler's Ruin and the Three State Markov Process.* Advisor: A. C. Krinik.

BS in **Applied Mathematics**
California State Polytechnic University, Pomona, Dec. 2002.

Academic Experience

Assistant Professor Mathematical Sciences
Dept. of Mathematical Sciences, Claremont McKenna College, July 2014–Current.

Assistant Adjunct Professor Program in Computing (PIC)
Mathematics Dept., University of California, Los Angeles, July 2011–June 2014.

Postdoctoral Scholar with A. L. Bertozzi
Mathematics Dept., University of California, Los Angeles, July 2011–June 2014.

Research Mentor Research Experiences for Undergraduates (REU)
Mathematics Dept., University of California, Los Angeles, June–Aug. 2011, 2012, 2013, 2014, 2015, 2017.

Academic Mentor Research in Industrial Projects for Students (RIPS)
Inst. for Pure & Applied Mathematics, UCLA, June–Aug. 2010, 2013.

Consultant *Mathematics of Crime Networks*
School of Mathematical Sciences, Claremont Graduate University, June–Aug. 2011.

Graduate Student Researcher for T. Strohmer
Mathematics Dept., University of California, Davis, July 2008–June. 2011.

Associate Instructor Differential Equations, Linear Algebra and Matlab Lab
Mathematics Dept., University of California, Davis, July 2006–Aug. 2008.

Research Fellow Mathematics of Knowledge and Search Engines
Inst. for Pure & Applied Mathematics, UCLA, Sept.–Dec. 2007.

Lead Teaching Assistant Calculus A,B,C and Short Calculus B
Mathematics Dept., University of California, Davis, Jan. 2006–June 2008.

Teaching Assistant Calculus A,B,C, Short Calculus A,B, Calculus for Biological Sciences A,C, and Linear Algebra
Mathematics Dept., University of California, Davis, Sept. 2005–June 2008.

Teaching Associate Basic Algebra, Intermediate Algebra and College Algebra
Mathematics Dept., California State Polytechnic University, Pomona, June 2004–Aug. 2005.

Teaching Assistant Pre-algebra and Basic Algebra
Mathematics Dept., California State Polytechnic University, Pomona, Mar.–June 2004.

Tutorial Program Specialist Math, Statistics, Physics and Economics
Learning and Skills Center, Mt. San Antonio College, Aug. 2003–June. 2004.

Tutor Math, Statistics, Physics, Chemistry, Economics and Engineering
Learning and Skills Center, Cal Poly, Pomona, Aug. 1999–Dec. 2004.

Courses Taught

Dept. of Mathematical Sciences, Claremont McKenna College
   Linear Algebra Spring 2017.
   Data Mining Spring 2017.
   Linear Algebra Fall 2016.
   Probability Fall 2016.
   Calculus I Spring 2016.
   Calculus I Spring 2016.
   Mathematical Finance Fall 2015.
   Probability Fall 2015.
   Data Mining Spring 2015.
   Linear Algebra Spring 2015.
   Calculus III, Multivariable (Honors) Fall 2014.

Probability Fall 2014.

Undergraduate Independent Research / Directed Research Courses

- Wyatt Cooper (CMC '17), Spring 2017.
- Alex Waggoner (CMC '17), Fall 2016 and Spring 2017.
- Dylan Baker (Harvey Mudd '17), Fall 2016 and Spring 2017.
- Ziv Green Epstein (Pomona '17) Spring 2016, Summer 2016, Fall 201 Spring 2017.
- Anna Novikova (Pomona '17), Fall 2016 and Spring 2017.
- Shirley Jiang (CMC '18), Spring 2017.
- Xichen Lin (CMC '18), Spring 2017.
- Yicong (Nicole) Lin (CMC '16), Fall 2016.
- Chong Shen (CMC '16), Fall 2015 and Spring 2016.
- Corey Hayes, (HMC '15), Online Topic Modeling, Summer 2015.
- Eleanor Dwyer, (Scripps '15), Mining Streaming Microblog Data, Summer 2015.
- Jackson Smith, (CMC '18), (Seaver Stipend Research Grant), Visualizing Big Data, Summer 2015.

Mathematics Dept., University of California, Los Angeles

Data Mining Spring 2014.
Introduction to Programming (C++) Spring 2014.
Principles of Java Language with Applications Spring 2014.
Introduction to Programming (C++) Fall 2013.
Principles of Java Language with Applications Fall 2013.
Introduction to Programming (C++) Spring 2013.
Principles of Java Language with Applications Spring 2013.
Introduction to Programming (C++) Winter 2013.
Principles of Java Language with Applications Winter 2013.
Linear Algebra, Introduction to Abstract Math Summer 2012.
Introduction to Programming (C++) Spring 2012.
Principles of Java Language with Applications Spring 2012.
Principles of Java Language with Applications Winter 2012.

Directed Research Courses

- Stephanie Sanchez, Fall 2013, Winter 2014, Spring 2014, and Summer 2015.
- Dan Moyer, Fall 2012, Winter 2013, Spring 2013, and Fall 2013.
- Jerry Luo, Fall 2013.
- Juhyun (Kim) Kim, Fall 2013.
- Qui Pham, (CSU Long Beach) Fall 2013.
- John Wu, Fall 2013.
- Anna Ma, Fall 2012, Winter 2013, and Spring 2013.
- Anh Tran, Spring 2012.

Mathematics Dept., University of California, Davis

Differential Equations Summer 2008.
Linear Algebra Summer 2007.
Matlab Mathematical Programing Lab Summer 2007.
Linear Algebra Summer 2006.
Matlab Mathematical Programing Lab Summer 2006.

Mathematics Dept., California State Polytechnic University, Pomona

College Algebra Summer 2005.
College Algebra Summer 2005.
Intermediate Algebra Spring 2005.

Intermediate Algebra Spring 2005.
Basic Algebra Winter 2005.
Basic Algebra Winter 2005.
Intermediate Algebra Fall 2004.

Students

Doctoral Advising
1. Jennifer Flenner, Institute of Mathematical Sciences, Claremont Graduate School. "Deep Topic Models for High-Dimensional Data Classification." Expected graduation 2017.

Doctoral Co-Advising
2. Eric Lai, Statistics Dept., University of California, Irvine. "Time Series Analysis - Self Exciting Point Processes." Co-Advisor: (department), expected graduation 2019.
3. Huiyi Hu, Mathematics Dept., University of California, Los Angeles. "Image Analysis, Community Detection and Multiplex." Co-Advisor: A. L. Bertozzi, PhD 2014.

Senior Thesis Advising
4. Wyatt Cooper, CMC '17, Extracting hidden network based topics from text, Spring 2017.
5. Anna Novikova, Pomona '17, Emotion and Sentiment Topic Models, Spring 2017.
6. Alex Waggoner, CMC '17, Detecting User Review Opinion using Topic Modeling, Spring 2017.
7. Ziv Green Epstein, Pomona '17, Hierarchical Topic Models and Multiplex Networks, Spring 2017.
8. Dylan Baker, Harvey Mudd '17, Dynamic Topic Models across time, Spring 2017.
9. Nicole Yicong Lin, CMC '16, Financial Topic Models, Fall 2016.
10. Chong Shen, CMC '16, Modeling the Syrian Refugee movement through social media, Spring 2016.

Senior Thesis Co-Advising
11. Edwin H. Villafane Hernandez, Pomona '17, Dynamic Topic Models (w/ Talithia Williams of HMC), Graduation Spring 2018.
12. Christopher Hoyt, Harvey Mudd '18, Dynamic Topic Models (w/ Talithia Williams of HMC), Graduation Spring 2018.
13. Matthew Aven, CMC '17, Compressed Data Mining (w/ Deanna Needell of CMC), Graduation Spring 2017.

Master's Co-Advising
14. **Directed Study** Justin Sunu, CSU, Long Beach, Spectral Clustering of Hyperspectral Imaging, Co-Advisor: Jen-Mei Chang, Summer 2012 - 2014.
15. **Directed Study** Ryan de Vera, CSU, Long Beach, Spectral Clustering and Social Networks, Co-Advisor: Jen-Mei Chang, Summer 2012 - 2013.
16. **Directed Study** Torin Gerhart, CSU, Long Beach, Sparse Low Rank Representation of Hyperspectral Images, Co-Advisor: Jen-Mei Chang, Fall 2012.

Research Project Advising

Project Lead
1. **ICERM's Predictive Policing workshop** Led / mentored a team of 11 researcher (Graduate Students, Post Docs, Faculty and Researchers) from around the world on a project titled *Topic Modeling of Crime, Social Media and Beyond*, Brown Univ.'s ICERM, Sept. 2016.

Summer Projects

2. **Research Experiences for Undergraduates (REU)** Michael Boggess (CMC), Bo Jones (CMC), Eric Lai (UC Irvine Math), Katie Khuu(UC Irvine Math), *Big Data and Social Networks*, Mathematics Dept., UCLA, June–Aug. 2015.

3. **Research Experiences for Undergraduates (REU)** Baichuan Yuan, Daniel Moyer, Cristina Lopez, Eric Lai, Zhaoyi Meng, Xiyang Luo and Alex Robicquet, *Large Data, Topic Point Process Models*, Mathematics Dept., UCLA, June–Aug. 2014.

4. **Research in Industrial Projects for Students (RIPS)** Daniel Bernstein, Yang Hu, Anna Ma, and Paul Sharkey, *Linking Social Media and Disorder, Emerging Topic Detection in Microblogs with the LAPD*, Inst. for Pure & Applied Mathematics, Los Angeles, June–Aug. 2013.

5. **Research Experiences for Undergraduates (REU)** Juhyun Kim, Qui Pham and Ryan de Vera, *Community Detection using Set Distances*, Mathematics Dept., UCLA, June–Aug. 2013.

6. **Research Experiences for Undergraduates (REU)** Jason Bello, Jerry Luo and Brian de Silva, *Content Based Document Search*, Mathematics Dept., UCLA, June–Aug. 2013.

7. **Research Experiences for Undergraduates (REU)** Mindy Case, Paul Chavy-Waddy and John Wu (co-advised with Theo Kolokolnikov), *Modeling Longitudinal Medical Data*, Mathematics Dept., UCLA, June–Aug. 2013.

8. **Research Experiences for Undergraduates (REU)** Huiyi Hu, Anna Ma, Daniel Moyer, Brendan Schneiderman and Ryan de Vera (co-advised with Yves van Gennip), *Social Networks and Gangs*, Mathematics Dept., UCLA, June–Aug. 2012.

9. **Research Experiences for Undergraduates (REU)** Ray Ahn, Peter Elliott and Kyle Luh (co-advised with Yves van Gennip), *Geosocial Network Models*, Mathematics Dept., UCLA, June–Aug. 2011.

10. **Research in Industrial Projects for Students (RIPS)** Edward Chang, Ed Dewey, Seckin Can Sahin and Maksim Tsikhanovich, *Topic Detection and Causal Influence in Microblogs with IBM Research*, Inst. for Pure & Applied Mathematics, Los Angeles, June–Aug. 2010.

Publications

Available from www.CMC.edu/pages/faculty/BHunter/.

Journal Publications

1. Y. van Gennip, B. Hunter, A. Ma, D. Moyer, R. de Vera, A.L. Bertozzi, "Unsupervised record matching with noisy and incomplete data" submitted, 2017.

2. J. Flenner, B. Hunter, "Deep Nonnegative Matrix Factorization" submitted, 2017.

3. E. Lai, D. Moyer, B. Yuan, E. Fox, B. Hunter, A.L. Bertozzi, P. J. Brantingham, "Topic Time Series Analysis of Microblogs" IMA Journal of Applied Mathematics, 81(3) pp. 409-431, 2016.

4. Y. van Gennip, B. Hunter, R. Ahn, P. Elliott, K. Luh, M. Halvorson, S. Reed, M. Valasik, j. Wo, G. Tita, A.L. Bertozzi and P.J. Brantingham "Community detection using spectral clustering on sparse geosocial data." SIAM Journal on Applied Mathematics (SIAP), 73(1), pp. 67-83, 2013.

5. B. Hunter, T. Strohmer, "Performance Analysis of Spectral Clustering on Compressed, Incomplete and Inaccurate Measurements." in review.

6. B. Hunter, T. Strohmer, "Spectral Embeddings and Diffusion Maps Under Perturbation.", in review.

7. L. M. Harbottle, B. Hunter and A. Krinik, "The General, Irreducible Three and Four-State Markov Process." Integration: Mathematical Theory and Applications, Vol. 2, No. 3, 2011.

8. B. Hunter, A. Krinik, C. Nguyen, J. Switkes and H. von Bremmen, "Gambler's Ruin with Catastrophes and Windfalls." Journal of Statistical Theory and Practice, Vol. 2, No. 2, page 199-219, 2008.

Refereed Conference Publications

9. J. Flenner and B. Hunter "Topic Model based Deep Neural Networks", submitted, 2017.

10. Y. van Gennip, H. Hu, B. Hunter, M.A. Porter, "Geosocial graph based community detection." Big

Data Analytics 2012 Conference, London, UK, 2012.

11. H. Hu, Y. van Gennip, B. Hunter, A.L. Bertozzi, M.A. Porter, "Multislice Modularity Optimization in Community Detection and Image Segmentation." IEEE International Conference on Data Mining, Brussels, BE, 2012.

12. B. Hunter, Y. Lou, A.L. Bertozzi, "A spectral graph based approach to analyze hyperspectral data." IEEE Applied Imagery Pattern Recognition, 2012.

13. B. Hunter, T. Strohmer, "Compressive Spectral Clustering - Error Analysis." AAAI Proceedings, 2010.

14. B. Hunter, T. Strohmer, "Compressive Spectral Clustering." AIP Conference Proceedings, 2010.

Theses

15. B. Hunter, "Data Mining Compressed, Incomplete and Inaccurate High Dimensional Data." PhD Dissertation, Mathematics Dept., University of California, Davis, 2011.

16. B. Hunter, "Gambler's Ruin and the Three State Markov Process." Master's Thesis, Mathematics Dept., Cal Poly, Pomona, 2005.

Technical Reports

17. Y. Lin, B. Hunter (Advisor) "Topic Analysis of of Hidden Trends in Patented Features Using Non-negative Matrix Factorization." CMC Senior Thesis, 2016.

18. C. Shen, B. Hunter (Advisor) "Topic Analysis of Tweets on the European Refugee Crisis Using Non-negative Matrix Factorization." CMC Senior Thesis, 2016.

19. M. Boggess, B. Jones, K. Khuu, E. Lai, D. Balague, B. Hunter, "Social Media Data - Analysis and Algorithms; Using Non-negative Matrix Factorization to Understand Twitter Data." UCLA CAM Report, August 2015.

20. E. Fox, B. Hunter, E. Lai, C. Lopez, X. Luo, Z. Meng, D. Moyer, A. Robicquet, B. Yuan, "Large data and social networks project on Topic Point Process Models." UCLA CAM Report, August 2014.

21. D. Bernstein, Y. Hu, A. Ma, P. Sharkey, B. Hunter, "Linking Social Media and Disorder, Emerging Topic Detection in Microblogs." IPAM RIPS Report, IPAM, 2013.

22. J. Kim, Q. Pham, R. de Vera, B. Hunter, "Community Detection using Set Distances." REU Report, University of California, Los Angeles, 2013.

23. J. Bello, J. Luo, B. de Silva, B. Hunter, "Content Based Document Search." REU Report, University of California, Los Angeles, 2013.

24. M. Case, P. Chavy-Waddy, J. Wu, B. Hunter, T. Kolokolnikov "Modeling Longitudinal Medical Data." REU Report, University of California, Los Angeles, 2013.

25. A. Ma, D. Moyer, B. Schneiderman, R. de Vera, Y. van Gennip, B. Hunter, "Duplicate detection and community analysis of Hollenbeck gangs." REU Report, University of California, Los Angeles, 2012.

26. R. Ahn, P. Elliott, K. Luh, Y. van Gennip, B. Hunter, "Social Network Clustering: An Analysis of Gang Networks." REU Report, University of California, Los Angeles, 2011.

27. E. Chang, E. Dewey, S. Sahin, M. Tsikhanovich, B. Hunter, "Topic Detection and Causal Influence in Microblogs." IPAM RIPS Report, IPAM, 2010.

Select Presentations

Conference Presentations

1. "Deep Learning Meets Matrix Factorizations Workshop" Three part workshop, Open Data Science Conference, Boston MA, 2017.

2. "Streaming Topic Models" IEEE Big Data Conference, San Jose CA, 2015.

3. "Visualizing Topics and Time Series Analysis in Twitter" Intelligence Community Academic Research Symposium 2015, Washington DC, Aug. 2015.

4. "Topic Modeling using Linear Algebra" CSU PUMP Program at Cal Poly, Pomona CA, July 2015.

5. "Topic Point Processes" SIAM Conference on Computational Science and Engineering, Geometric Methods for Graph Partitioning Salt Lake City Utah, March 2015.

6. "Spectral methods for topic modeling on big data." Network Science and Graph Algorithms, Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI, Feb. 2014.
7. "Spectral methods for analyzing large data." AMS Sectional Meeting, Special Session on Computational Problems on Large Graphs and Applications, UC Riverside, Nov. 2013.
8. "Spectral graph based community detection." AMS MAA Joint Math Meetings Special Session on Stochastic and Functional Analysis, San Diego, CA, Jan. 2013.
9. "Data mining social and high dimensional data." IEEE International Conference on Data Mining, Brussels, Belgium, Dec 2012.
10. "A spectral graph based approach to analyze hyperspectral data." IEEE Applied Imagery Pattern Recognition, Washington D.C., Oct. 2012.
11. "Geosocial graph based community detection." PIMS Hot Topics Workshop on Computational Criminology at Simon Fraser University, Vancouver, Canada, Sept. 2012.
12. "Data Mining Social and Hyperspectral Data" SIAM Annual Meeting, Minneapolis, MN, July 2012.
13. "The General, Irreducible Three and Four-State Markov Process." AMS MAA Joint Mathematics Meetings, New Orleans, LA, Jan. 2011.
14. "Compressive spectral clustering - error analysis." AAAI Symposium on Manifold Learning and it's Applications, Arlington, VA, Nov. 2010.
15. "Compressive spectral clustering - perturbation theory." AMS Western Section Meeting, Mathematical Models of Random Phenomena, UCLA, Oct. 2010.
16. "Compressive spectral clustering." ICNAAM Sparse Approximation and Compressed Sensing, Rhodes, Greece, Sept. 2010.
17. "Compressive spectral clustering." UCLA's IPAM Lake Arrowhead Workshop, Lake Arrowhead, CA, June 2010.
18. "Compressed diffusion maps." AMS Western Section Meeting, Stochastic Analysis and Applications, UC Riverside, Nov. 2009.
19. "Exploring the world of MR brain images via Harmonic Analysis." UCLA's IPAM Lake Arrowhead Workshop, Lake Arrowhead, CA, June 2009.
20. "Diffusion based classification of MR brain images." SIAM Student Research Conference, Davis, CA, May 2009.
21. "Diffusion based clustering of MR brain images." UCLA's IPAM, Mathematics in Brain Imaging, Los Angles, CA, July 2008.
22. "MR brain image clustering via harmonic analysis." UCLA's IPAM Lake Arrowhead Workshop, Lake Arrowhead, CA, Dec. 2007.
23. "Diffusion based clustering." UCLA's IPAM, Mathematics of Knowledge and Search Engines, Los Angles, CA, Dec. 2007.
24. "Gambler's ruin with catastrophes and windfalls." AMS and MAA joint conference - AMS Session on Probability and Statistics, New Orleans, LA - Jan. 2007.

Invited Seminars and Colloquia

25. "Deep Learning Meets Matrix Factorizations" University of Nottingham Colloquium, Nottingham UK, May 2017.
26. "Deep Learning Meets Matrix Factorizations" CCMS Applied Math Seminar, Claremont CA, Mar. 2017.
27. "Text Mining with Linear Algebra." CSU Fullerton Colloquium, Fullerton CA, Sept. 2016.
28. "Building Graphs for Big Data." Cal Poly Pomona Mathematics Colloquium, Pomona CA, May 2015.
29. "Data Mining using Topic Modeling." Harvey Mudd Computer Science Colloquium, Claremont CA, May 2015.
30. "Expander Graphs and Data Mining." Algebra Number Theory Seminar, Claremont Mathematics Consortium, Claremont CA De. 2015.
31. "Spectral embedding methods and topic modeling." Mathematical Sciences Seminar, University of

Nottingham, UK, Jan. 2014.

32. "Modularity with Online Updates." Mathematical Institute Lecture, University of Oxford, UK, Jan. 2014.

33. "Big data Spectral embedding methods and topic modeling." CCMS Colloquium, Pomona College, Nov. 2013.

34. "Spectral approaches for data mining." Undergraduate Mathematics Students Association, UCLA, Feb. 2013.

35. "Data mining using spectral graph theory." Math Colloquium, Loyola Marymount University, Feb. 2013.

36. "Spectral graph based approaches to analyze high dimensional data." Math Colloquium, CSU Fullerton, Feb. 2013.

37. "Data mining social and high dimensional data." Applied Math Seminar, UC Riverside, Nov. 2012.

38. "Data mining social networks and hyperspectral images." Stan Osher's Level Set Collective Seminar, UCLA, Oct. 2012.

39. "Spectral embedding of social networks with compressed, incomplete and inaccurate measurements." Applied Math Seminar, UCLA, Dec. 2011.

40. "Spectral embedding of social networks with compressed, incomplete and inaccurate measurements." Applied Math Seminar, Claremont McKenna College, Dec. 2011.

41. "Data Mining Compressed, Incomplete and Inaccurate High Dimensional Data." Applied Math Seminar, UC Davis, May 2011.

42. "Low dimensional embedding with compressed, incomplete and inaccurate measurements." Student-Run Math/Applied Math Seminar, UC Davis, Apr. 2011.

43. "Low dimensional embedding with compressed, incomplete and inaccurate measurements." CCMS Colloquium, Claremont McKenna College, Mar. 2011.

44. "Data Mining Compressed, Incomplete and Inaccurate High Dimensional Data." Applied Math Research Group, UCLA, Mar. 2011.

45. "Normalized Cuts and Image Segmentation." Advanced Image Processing and Analysis, UC Davis, Apr. 2008.

46. "Diffusion Based Clustering." Applied Math Seminar, UC Davis, Feb. 2008.

47. "Diffusion Maps for Data Mining." Student-Run Seminar, UC Davis, Mar. 2008.

48. "Descendants of Fast Multipole Methods." Applied Computational Harmonic Analysis Seminar, UC Davis, Feb. 2007.

49. "Gambler's ruin with catastrophes and windfalls." Student-Run Seminar, UC Davis, Feb. 2006.

Other Presentations

50. "Modeling a Zombie Epidemic" John Hopkins' Center for Talented Youth, Claremont CA, April 2017.

51. "Modeling a Zombie Epidemic" GEMS, Claremont CA, Feb. 2017.

52. "Math for the New Millennium : Ideas that Changed the World - Topic Modeling" Athenaeum, Claremont CA, Oct. 2015.

53. "Modeling Epidemics I, II, III" John Hopkins' Center for Talented Youth, Claremont CA, Oct. 2015.

54. "Beyond Calculus - Math in Unexpected Places" UCLA Undergraduate Math Club, invited talk, UCLA, Feb. 2015.

55. "What can I do with a math degree?" UCLA Undergraduate Math Club, invited talk, UCLA, Feb. 2015.

56. "Mathematics of Tessellations" The Gateway to Exploring Mathematical Sciences program (GEMS) mini course, (Claremont Center for the mathematical sciences), February 2015.

57. "UCLA REU tutorials" (Matlab, Clustering, Dimension Reduction, Topic Modeling), Los Angeles CA, June 2015

58. "Spectral methods tutorial" Network Science and Graph Algorithms, ICERM, Providence, RI, Feb 2014.

59. "Topic Modeling tutorial" Network Science and Graph Algorithms, ICERM, Providence, RI, Feb 2014.
60. "Reweighted Topic Modeling for High Dimensional Data" Keck Neroscience Meeting, UCLA, California NanoSystems Institute (CNSI), Oct 2013.
61. "Data Mining Social Networks" Inferring Structure and Forecasting Dynamics on Evolving Networks, MURI meeting, USC, Information Sciences Institute (ISI), March 2013.
62. "Multiscale and Multiplex Networks" (with H. Hu and Y. van Gennip) Image Processing Research Group, UCLA, Los Angeles, CA, June 2012.
63. "Diffusion Interface Models and Image Inpainting" Image Processing Research Group, UCLA, May 2011.
64. "Spectral Mapping of Hyperspectral Images." (with Y. Lou) Image Processing Research Group, UCLA, Los Angeles, CA, Apr. 2012.
65. "Sparse Unsupervised Gang Clustering" (with J. Brantingham and Y. van Gennip) Image Processing Research Group, UCLA, Los Angeles, CA, Feb. 2012.
66. "Data mining via diffusion maps and harmonic analysis." Image Processing Research Group, UCLA, Nov. 2011.
67. "Gang organization and violence from small group spatial activity data." (with J. Brantingham* and Y. van Gennip) Networks AFOSR MURI Meeting, UCLA, Los Angeles, CA, Sept. 2011.
68. "Analyzing Social Transmission using Mobile Geometric Graphs." (with A. Percus* and Y. van Gennip) Networks AFOSR MURI Meeting, UCLA, Los Angeles, CA, Sept. 2011.
69. "Social Network Clustering: An Analysis of Gang Networks." Game Theory MURI Meeting, USC, Los Angeles, CA, Sept. 2011.
70. "Martingale and Brownian Processes." Guest lecture - Intro. to Stochastic Processes (Graduate Level), Stanford University, May 2011.
71. "Data mining via diffusion maps and harmonic analysis." Compressed Sensing Research Group, Stanford University, Apr. 2011.
72. "Topic Detection and Causal Influence in Microblogs." RIPS (IBM Research project), IPAM UCLA, Aug. 2010.
73. "Linear algebra, singular value decomposition and Matlab." RIPS Tutorials, IPAM UCLA, June 2010.
74. "Compressed sensing, sparsity and ℓ_1 minimization." RIPS Tutorials, IPAM UCLA, June 2010.
75. "Machine learning, clustering and regression, convex optimization, regularization and kernel methods." RIPS Tutorials, IPAM UCLA, June 2010.
76. "Compressive spectral clustering." NIPS Manifolds, sparsity, and structured models, poster session, Vancouver, B.C., Canada, Dec. 2009.
77. "Data Mining via Harmonic Analysis." UC Davis Recruitment Student Talks, Apr. 2008.
78. "Diffusion Based Clustering." Qualifying Examination, UC Davis, Mar. 2008.
79. "Diffusion Maps for Data Mining." Junior Research Group, IPAM UCLA, Nov. 2007.
80. "Laplacian Eigenfunctions for Dimension Reduction." Junior Research Group, IPAM UCLA, Oct. 2007.
81. "Gambler's Ruin and the Three State Markov Process, a Combinatorics Approach." Masters Thesis Defense, Cal Poly Pomona, June 2005.

Conferences and Workshops Organized
1. MSRI Summer Graduate School, Representations of High Dimensional Data, Berkeley CA, 2018
   Program Co-Organizer.
2. Gateway to Exploring Mathematical Sciences (GEMS), Claremont CA, Sept. 2016 - June 2018
   Monthly Workshop Organizer.
3. IEEE, ICDM 2015, International Conference on Data Mining, Atlantic City NJ, Nov. 2015
   Workshop Organizer - Graphical Methods for Imaging and Networks (GAIN).
   Proceedings Review Board Member / Reviewer.

Grants, Honors and Awards

Alfred P. Sloan Foundation Grant, MSRI speaker series and summer school (co-PI) ($ 124,982), Grant Number G-2016-7296.

NSF MSRI Summer Graduate School Grant, Representations of High Dimensional Data, 2018.

NSF Research Travel Award at ICERM, Summer 2016.

NSF Research Travel Award at IPAM, Spring 2016.

NSF Research Fellowship, Institute for Computational and Experimental Research in Mathematics (ICERM), 2013.

California Research Training Program in Computational and Applied Mathematics, Summers 2011-2015, (Junior faculty) NSF Grant DMS-1045536.

SIAM Nugget, Highlighting Applied Math Research, Feb. 2013.

UC Davis, Graduate Student Researchship, Jan. 2009 to June 2011.

NSF VIGRE Summer Research Fellowship, June 2008.

NSF VIGRE Research Fellowship, Sept. 2008.

NSF Research Fellowship at IPAM, Fall 2007.

NSF VIGRE Summer Research Fellowship, 2007.

UC Davis, Graduate Teaching Assistantship, Sept. 2005 to June 2008.

UC Davis Mathematics Block Grant, Sept. 2005.

Cameron Bogue Memorial Scholarship in Statistics, Jan. 2005.

Cal Poly Pomona, Teaching Assistantship, Mar. 2003 to Aug. 2005.

Committees

Current

CMC - Administration Committee - Member, Fall 2015 - Current.

CMC - Activities Committee - Member, Fall 2015 - Current.

Claremont Center for the Mathematical Sciences (CCMS) - Applied Math Seminar - Co-Organizer, Fall 2014 - Current.

CCMS - Gateway to Exploring Mathematical Sciences (GEMS) - Organizer, Spring 2016 - Current.

Previous

UC Davis SIAM club - Organizational Committee, 2007-2009.

UC Davis Mathematics Graduate Student Group - Events Coordinator 2006-2008, Tutoring Fund raiser Organizer 2008, Dual Pair Organizer 2006-2007, Welcome Organizer 2006-2007.

UC Davis Graduate Student Association - Representative, 2006-2008.

UC Davis Math Cafe Tutor - Coordinator, 2005-2007.

Undergraduate Academic Advising

Academic Advising

1. Sydney Baffour (CMC20) Computer Science
2. Lindsey Cleary (CMC20) Computer Science
3. Allison Gould (CMC20) Mathematics
4. Ryan Holman (CMC20) Computer Science
5. Alex Kenworthy (CMC20) Computer Science
6. Andrew Lewis (CMC20) Philosophy
7. Ethan Lewis (CMC20) Computer Science
8. Bridget McCarthy (CMC20) Computer Science
9. Bradley Newton (CMC20) Computer Science
10. Gino Townsend (CMC20) Computer Science

11. Kira Weiss (CMC20) Computer Science
12. Xichen Lin (CMC18)
13. Maia Adar (CMC18) Math
14. Kate Layman (CMC18) dual Math / Econ
15. Ziv Green Epstein (Pom17) Math
16. Anna Novikova (Pom17) Math
17. Alex Waggoner (CMC17) Math / Econ
18. Matthieu Hafemeister (CMC17) dual Math / Econ
19. Chong Shen (CMC16) dual Math / International Relations

Academic Co-Advising
20. Dylan Baker (HMC17) Math
21. Christopher Hoyt (HMC18) Math
22. Nick Daifotis (CMC17) dual Math / Econ
23. Eduardo Ramirez (CMC16) dual Math / Econ
24. Shirley Jiang (CMC 18) dual Math / Econ
25. Sam Firth (CMC 17) dual Math / Econ
26. Bo Jones (CMC17) Math
27. Michael Boggus (CMC17) Math / CS
28. Yicong (Nicole) Lin (CMC 16) math

Professional Activities

Journal Reviewing
IEEE, International Conference on Data Mining Proceedings
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
Journal of Pattern Recognition Research
Neural Information Processing Systems (NIPS) Paper Proceedings
Journal of Computational and Applied Mathematics
Mathematics of Computation
Public Library of Science (PLOS) ONE

Book Reviewing
John Wiley & Sons, Inc.

Society Memberships
Society for Industrial and Applied Mathematics (SIAM) - Member
American Mathematical Society (AMS) - Member
Mathematical Association of America (MAA) - Member
Institute of Electrical and Electronics Engineers (IEEE) - Member
Golden Keys International Honor Society - Member

Computer Skills

Programming Languages
C, C++, Java, JavaScript, Python, Assembly, Cuda, HTML, XML, Visual Basic, Android.

Mathematical Software
Matlab, Mathematica, Maple, SAS, R, LaTeX.