Deanna Needell

CONTACT
INFORMATION

Department of Mathematics
Claremont McKenna College
Adams Hall
850 Columbia Avenue
Claremont CA, 91711

(909) 607-1064
dneedell@cmc.edu
www.cmc.edu/pages/faculty/DNeedell

CITIZENSHIP

USA

RESEARCH
INTERESTS

Compressed Sensing, Randomized Algorithms, Functional Analysis, Computational Mathematics, Probability, Statistics.

EDUCATION

PhD in **Mathematics**
University of California, Davis, May 2009
Dissertation Title: *Topics in Compressed Sensing.* Adviser: R. Vershynin.

MA in **Mathematics**
University of California, Davis, Sept. 2005

BS in **Mathematics** (valedictorian)
Second major in **Computer Science**
University of Nevada, Reno, Dec. 2003

ACADEMIC
EXPERIENCE

Associate Professor
Mathematics Dept., Claremont McKenna College, July 2011–current

Academic Mentor
Research Experience for Undergraduates (REU), Univ. of California, Los Angeles, June 2014–Aug. 2014

Academic Mentor
Research in Industrial Projects for Students (RIPS), Univ. of California, Los Angeles, June 2012–Aug. 2012

Postdoctoral Fellow
Statistics and Mathematics Depts., Stanford University, Sept. 2009–June 2011

Mentor for VIGRE VPUE Undergraduate Summer Workshop
Statistics Dept., Stanford University, June–Sept. 2010

Instructor
Mathematics Dept., University of California, Davis, 2005–2009

Instructor
Mathematics Dept., Solano Community College, May–Aug. 2009

Explore Math Instructor for Math Circle
Mathematics Dept., University of California, Davis, Jan.–Mar. 2009

Graduate Student Researcher for R. Vershynin
Mathematics Dept., University of California, Davis, 2006– 2009

Instructor
Mathematics Dept., Sacramento City College, 2007–2008

Lead Teaching Assistant
Mathematics Dept., University of California, Davis, 2007–2008

Instructor
Mathematics Dept., University of Nevada, Reno, Jan.–Aug. 2004

Tutor for Math, Physics, Computer Science, Economics
Learning and Skills Center, University of Nevada, Reno, Nov. 1999–Dec. 2003

COURSES TAUGHT **Deep Learning**, Indep. Study, Claremont Graduate Univ., Fall 2014

Practical Compressive Signal Proc., Indep. Study, UCLA, Fall 2014

Calculus I, Math 30, Claremont McKenna College, Spring 2014

Stochastic Greedy Algorithms, Indep. Study, Claremont Graduate Univ., Spring 2014

Iterative Projection Methods, Indep. Study, Claremont Graduate Univ., Spring 2014

Super-resolution, Indep. Study, Claremont Graduate Univ., Spring 2014

Introduction to Statistics, Math 52, Claremont McKenna College, Fall 2011 - Spring 2012

Topics in Compressive Sensing, Indep. Study, Claremont Graduate Univ., Spring 2012 & 2013

Probability, Math 151, Claremont McKenna College, Fall 2011 & 2013

Mathematical Statistics, Math 152, Claremont McKenna College, Spring 2012 & 2013

Introduction to Wavelets, Math 168, Claremont McKenna College, Fall 2013

Stochastic Processes (graduate), Stat 317, Stanford, Spring 2010, Spring 2011

Statistical Methods in Engineering & Physical Sciences, Stat 110, Stanford, Fall 2010

Probabilty Theory, Stat 116, Stanford, Fall 2009

Number Theory, Math 115A, UC Davis, Summer 2009

Intermediate Algebra, Math 104, Solano Comm. College, Summer 2009

Abstract Mathematics, Math 108, UC Davis, Summer 2008

Probability and Statistics, Math 300, Sacramento City Coll., Summer 2008

Intermediate Algebra, Math 120, Sacramento City Coll., Fall 2007

Beginning Algebra, Math 100, Sacramento City Coll., Spring 2007

Precalculus, Math 12, UC Davis, Summer 2005

College Algebra, Math 120, Univ. of Nevada Reno, Summer 2004

Survey of Math, Math 100, Univ. of Nevada Reno, Spring 2004

STUDENTS

Thesis Advising

Phillip North, Claremont McKenna College. Expected graduation: 2015.

Jonathon Briskman, Claremont McKenna College. Graduation: 2014.

Evan Casey, Claremont McKenna College. Graduation: 2014.

Nathan Falk, Claremont McKenna College. Graduation: 2014.

Aparna Sarkar, Pomona College. Graduation: 2014.

Zachary Siegel, Pomona College. Graduation: 2014.

Nathan Lenssen, Claremont McKenna College. Graduation: 2013.

Morgan Mayer-Jochimsen, Scripps College. Graduation: 2013.

Jing Wen, Pomona College. Graduation: 2013.

Graduate Advising

Casey Johnson, Claremont Graduate University. Expected graduation: 2016.

Anna Ma, Claremont Graduate University. Expected graduation: 2015.

Tina Woolf, Claremont Graduate University. Expected graduation: 2016.

Ran Zhao, Claremont Graduate University. Expected graduation: 2014.

Doctoral Committee: Qian Jane Xu, Mathematics, Claremont Graduate University and San Diego State University. Expected graduation: 2015. Adviser: Jianwei Chen. *Generalized Linear Varying-Coefficient Model with Data Missing at Random.*

Doctoral Committee: Yanting Ma, Electrical Engineering, North Carolina State University. Expected graduation: 2016. Adviser: Dror Baron.

HONORS AND
AWARDS

NSF Career award #1348721

2014 Alfred P. Sloan Research Fellowship

ICERM Research Fellowship, Fall 2014

University of Nevada Alumni of the Year Award (2014)

2013 ACHA Top 1 Hottest Article (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

2013 ACHA Top 4 Hottest Article (Compressed sensing with coherent and redundant dictionaries)

BLAIS Collaboration Grant, 2013-2015

Simons Foundation Collaboration Grant #274305 for Mathematicians, 2013-2018

BLAIS collaboration course grant (Wavelets & their applications), 2013

2012 IEEE Signal Processing Society Young Author Best Paper Award (Signal Recovery from Incomplete and Inaccurate Measurements Via Regularized Orthogonal Matching Pursuit)

AIM SQuaRE Research Group Grant

AMS Simons Travel Grant, 2012

2012 ACHA Top 2 Hottest Article (Compressed sensing with coherent and redundant dictionaries)

2012 ACHA Top 3 Hottest Article (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

Challenges in Geometry, Analysis, and Computation: High-Dimensional Synthesis, Yale University Travel Award, 2012

2011 ACHA Top 5 Hottest Article (Compressed sensing with coherent and redundant dictionaries)

2011 ACHA Top 4 Hottest Article (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

ScienceWatch Fast-Breaking Paper (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

Communications of the ACM paper selection (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

2010 ACHA Top 2 Hottest Article (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

Workshop on Sparsity and Computation Travel Award, 2010

AT13 International Conference Travel Award, 2010

2009 ACHA Top 3 Hottest Article (CoSaMP: Iterative signal recovery from incomplete and inaccurate samples)

Henzl-Gabor Travel Award, 2009-2010

SAMPTA'09 Travel Scholarship

VIGRE Graduate Fellowship, 2009

Graduate Council's Gradute Student Travel Award, 2008

Consortium for Women and Research Travel Award, 2008

Alice Leung Scholarship in Mathematics, 2008

UCD & Humanities Graduate Research Award, 2008

UC Davis Mathematics Block Grant, 2008

VIGRE Summer Research Fellowship, 2008

UCD & Humanities Graduate Research Award, 2007

UC Davis Mathematics Block Grant, 2007

Graduate Student Mentorship with mentor Prof. Vershynin, 2006

UCD & Humanities Graduate Research Award, 2006

Graduate Student Mentorship with mentor Prof. Vershynin, 2005

UCD & Humanities Graduate Research Award, 2005

VIGRE Summer Research Fellowship, 2005

VIGRE Graduate Fellowship, 2004

E.W.B. Math and Science Scholarship, 2004

Senior Scholar of the College of Arts and Sciences, Univ. of Nevada, 2003

ACM Northwest Regional Programming Contest 2003, 6th place

ACM Northwest Regional Programming Contest 2002, 28th place

Nevada Women's Fund Academic Scholarship, 2002-2004

Golden Key National and Phi Kappa Phi Honor Societies, 1999

University of Nevada Academic Scholarship, 1998 - 2003

Publications   Available from `www.cmc.edu/pages/faculty/DNeedell`.

Refereed Journal Publications

1. R. Giryes, D. Needell. "Near Oracle Performance of Signal Space Greedy Methods." Journal of Approximation Theory, to appear.

2. D. Needell, N. Srebro, R. Ward. "Stochastic Gradient Descent and the Randomized Kaczmarz algorithm." Mathematical Programming Series A, to appear.

3. J. Briskman and D. Needell. "Block Kaczmarz Method with Inequalities." Journal of Mathematical Imaging and Vision, vol. 52, num. 3, 385–396, 2015.

4. Y. Ma, D. Baron, D. Needell. "Two-Part Reconstruction with Noisy-Sudocodes." IEEE Transactions on Signal Processing, vol. 62, iss. 23, 6323–6334, 2014.

5. R. Giryes and D. Needell. "Greedy Signal Space Methods for Incoherence and Beyond." Applied and Computational Harmonic Analysis, to appear.

6. G. Chen, A. Divekar, D. Needell. "Guaranteed sparse signal recovery with highly coherent sensing matrices." Sampling Theory in Signal Analysis and Image Processing, to appear.

7. M. A. Davenport, D. Needell and M. B. Wakin. "Signal Space CoSaMP for Sparse Recovery with Redundant Dictionaries." *IEEE Transactions on Information Theory*, vol. 59, iss. 10, 6820 - 6829, 2013.

8. N. Lenssen and D. Needell. "On the Mathematics of Music: From Chords to Fourier Analysis." Journal of Humanistic Mathematics, vol. 4, iss. 1, pp. 72-91, 2014.

9. D. Needell and R. Ward, "Near-optimal compressed sensing guarantees for total variation minimization." IEEE Transactions on Image Processing, vol. 22, iss. 10, pp. 3941 - 3949, 2013.

10. D. Needell and J. A. Tropp. "Paved with Good Intentions: Analysis of a Randomized Block Kaczmarz Method." Linear Algebra and its Applications, pp. 199-221, 2014.

11. B. Cung, T. Jin, J. Ramirez, A. Thompson, C. Boutsidis and D. Needell. "Spectral Clustering: An empirical study of Approximation Algorithms and its Application to the Attrition Problem." SIAM Undergraduate Research Journal, vol. 5, pp. 283-303, 2012.

12. D. Needell and R. Ward, "Stable image reconstruction using total variation minimization." *SIAM Journal on Imaging Sciences*, vol. 6, num. 2, pp. 1035-1058, 2013.

13. D. Needell and R. Ward, "Two-subspace Projection Method for Coherent Overdetermined Systems." *Journal of Fourier Analysis and Applications*, vol. 19, num. 2, pp.256-269, 2013.

14. Y. C. Eldar, D. Needell and Y. Plan, "Uniqueness Conditions For Low-Rank Matrix Recovery," *Applied and Computational Harmonic Analysis*, vol. 33, num. 2, pp. 309-314, 2012.

15. M. Hornstein, Adviser D. Needell, "Robust Principal Component Analysis Conditions," Rose-Hulman Undergraduate Mathematics Journal, vol. 12, num. 2, pp.137-161, 2011.

16. Y. C. Eldar and D. Needell, "Acceleration of Randomized Kaczmarz Method via the Johnson-Lindenstrauss Lemma," *Numerical Algorithms*, vol. 58, num. 2, pp. 163-177, 2011.

17. E. J. Candès, Y. C. Eldar, D. Needell, and P. Randall, "Compressed sensing with coherent and redundant dictionaries," *Applied and Computational Harmonic Analysis*, vol. 31, num. 1, pp. 59-73, 2011.

18. D. Needell, "Randomized Kaczmarz solver for noisy linear systems." *BIT Numerical Mathematics*, vol. 50, num. 2, pp. 395-403, 2010.

19. D. Needell and J. A. Tropp, "CoSaMP: Iterative signal recovery from incomplete and inaccurate samples." *Applied and Computational Harmonic Analysis*, vol. 26, num. 3, pp. 301-321, 2009.

20. D. Needell and R. Vershynin, "Signal Recovery from Inaccurate and Incomplete Measurements via Regularized Orthogonal Matching Pursuit." *IEEE Journal of Selected Topics in Signal Processing*, vol. 4, pp. 310-316, 2010.

21. D. Needell and R. Vershynin, "Uniform Uncertainty Principle and signal recovery via Regularized Orthogonal Matching Pursuit." *Foundations of Computational Mathematics*, vol. 9, num.3, pp. 317-334, 2009.

Conference Publications

1. M. Davenport, A. Massimino, D. Needell and T. Woolf. "Constrained Adaptive Sensing." *Proc. Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, Cambridge, UK, July 2015.

2. F. Krahmer, D. Needell and R. Ward. "Compressive Sensing with Redundant Dictionaries and Structured Measurements." *Proc. 12th International Conf. on Sampling Theory and Applications (SAMPTA)*, May 2015.

3. N. Nguyen, D. Needell, and T. Woolf. "Stochastic Greedy Methods with Sparse Constraints." Proc. Information Theory and Applications (ITA), La Jolla CA, Jan. 2015.

4. D. Needell, N. Srebro, R. Ward. "Stochastic Gradient Descent, Weighted Sampling, and the Randomized Kaczmarz algorithm." Proc. Neural Information Processing Systems (NIPS), Dec. 2014.

5. C. Garnatz, X. Gu, A. Kingman, J. LaManna, D. Needell, S. Tu. "Practical approximate projection schemes in greedy signal space methods." *Proc. Allerton Conf. on Communication, Control, and Computing*, Allerton, IL, Oct. 2014.

6. A. Ma, A. Flenner, D. Needell, A. Percus. "Improving Image Clustering using Sparse Text and the Wisdom of the Crowds." *Proc. 46th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, Nov. 2014.

7. R. Zhao, D. Needell, C. Johansen, J. L. Grenard. "A Comparison of Clustering and Missing Data Methods for Health Sciences." *Proc. 46th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, Nov. 2014.

8. Y. Ma, D. Baron, and D. Needell. "Two-Part Reconstruction in Compressed Sensing." Proc. IEEE Global Conf. Signal Inf. Process., Austin, TX, Dec. 2013.

9. N. Jamil, D. Needell, J. Muller, C. Lutteroth, and G. Weber. "Kaczmarz Algorithm with Soft Constraints for User Interface Layout." *IEEE International Conference on Tools with Artificial Intelligence (ICTAI)*, Nov. 2013.

10. L. Demanet, D. Needell, and N. Nguyen, "Super-resolution via superset selection and pruning." *Proc. 10th International Conf. on Sampling Theory and Applications (SAMPTA)*, July 2013.

11. A. Divekar and D. Needell, "Using Correlated Subset Structure for Compressive Sensing Recovery." *Proc. 10th International Conf. on Sampling Theory and Applications (SAMPTA)*, July 2013.

12. M. A. Davenport, D. Needell, and M. B. Wakin, "Signal Space CoSaMP for Sparse Recovery with Redundant Dictionaries." *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, 2013.

13. M. A. Davenport, D. Needell, and M. B. Wakin, "CoSaMP with redundant dictionaries." *Proc. 46th Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, Nov. 2012.

14. M. Herman and D. Needell, "Mixed Operators in Compressed Sensing." *CISS 2010 (44th Annual Conf. on Info. Sciences and Systems)*, Princeton, NJ, Mar. 2010.

15. D. Needell, "Noisy signal recovery via reweighted ℓ_1-minimization." *Proc. Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 2009.

16. D. Needell and R. Vershynin, "Signal Recovery from Inaccurate and Incomplete Measurements via ROMP." *Proc. 8th International Conf. on Sampling Theory and Applications (SAMPTA)*, May 2009.

17. D. Needell, J. A. Tropp and R. Vershynin, "Greedy Signal Recovery Review." *Proc. 42nd Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, Oct. 2008.

18. D. Needell and R. Vershynin, "Greedy signal recovery and uncertainty principles." *Proc. SPIE* Vol. 6814, 68140J, San Jose, Jan. 2008.

19. D. Needell, J. Stuart, T. Thiel, M. Dascalu and F. Harris Jr., "Software requirements specification for a university class scheduler." *Proc. Int. Conf. on SERP*, Las Vegas, June 2003.

Preprints

1. F. Krahmer, D. Needell and R. Ward. "Compressive Sensing with Redundant Dictionaries and Structured Measurements." Submitted.

2. G. Chen and D. Needell, "Compressed sensing and dictionary learning." Chapter in *Finite Frame Theory: A Complete Introduction to Overcompleteness*, Submitted.

3. R. Baraniuk, S. Foucart, D. Needell, Y. Plan, M. Wootters. "Exponential decay of reconstruction error from binary measurements of sparse signals." Submitted.

4. N. Nguyen, D. Needell, and T. Woolf. "Linear Convergence of Stochastic Iterative Greedy Algorithms with Sparse Constraints." Submitted.

5. D. Needell, R. Zhao, A. Zouzias. "Randomized Block Kaczmarz Method with Projection for Solving Least Squares." Submitted.

Other Publications

1. G. Chen and D. Needell, "Compressed sensing and dictionary learning." Chapter in *Finite Frame Theory: A Complete Introduction to Overcompleteness*, AMS Joint Math Meetings 2015.

2. D. Needell and R. Ward, "Near-optimal compressed sensing guarantees for anisotropic and isotropic total variation minimization." CMC Faculty Publications and Research Technical Report, Paper 318, 2013.

3. D. Needell and R. Ward, "Two-subspace Projection Method for Coherent Overdetermined Systems." CMC Faculty Publications and Research Technical Report, Paper 35, 2012. DOI: 10.5642/tspmcos.2012.01.

4. D. Needell and J. A. Tropp, "CoSaMP: Iterative signal recovery from incomplete and inaccurate samples." Communications of the ACM, *Research Highlights* section, Dec. 2010.

5. D. Needell, "Topics in Compressed Sensing." PhD Dissertation, Mathematics, Univ. of California, Davis, May 2009.

6. D. Needell and J. A. Tropp, "CoSaMP: Iterative signal recovery from incomplete and inaccurate samples." Technical Report, Mar. 2008. Revised July 2008.

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Conference Presentations

1. "Recovering overcomplete sparse representations from structured sensing." GAMM 86th Annual Scientific Conference, Lecce Italy (remote), Mar. 23, 2015.

2. "Stochastic Iterative Greedy Algorithms for Sparse Reconstruction." Information Theory and Applications (ITA), La Jolla CA, Feb. 5, 2015.

3. Session organizer, 22nd International Symposium on Mathematical Programming, Pittsburgh PA, July 12-17, 2015.

4. "Less is more: Compressed sensing for imaging and big data." Keynote address, Claremont Graduate University Conference on Big Data, Claremont CA, Nov. 21, 2014.

5. "Greedy methods for generalized sparse approximation." Allerton Conference on Communication, Control, and Computing, Allerton IL, Oct. 3, 2014.

6. "Adaptively Sensing in Compressive Sensing Applications." SIAM Annual Meeting, speaker and session organizer, Chicago IL, July 11, 2014.

7. "Greedy Algorithms in Super-Resolution." Imaging and Modeling in Electron Microscopy - Recent Advances, Banff, Canada, May 19, 2014.

8. "SGD and Randomized Projections methods for linear systems." Stochastic Gradient Methods, IPAM, UCLA, Feb. 25, 2014.

9. "Things we know and don't know about practical compressive sensing." French-German Conference on Mathematical Image Analysis, Jan. 13, 2014.

10. "Iterative methods for super-resolution." Duke Workshop on Sensing and Analysis of High-Dimensional Data, Duke University, July 24, 2013.

11. "Using Correlated Subset Structure for Compressive Sensing Recovery." Sampling Theory and Applications (SAMPTA), Bremen, Germany, July 2, 2013.

12. "Synthesis and analysis type methods for signal reconstruction from random observations." Structure and Randomness in System Identification and Learning, IPAM, UCLA, Jan. 18, 2012.

13. "Robust image recovery via total variation minimization." 5th Annual Women in Mathematics Symposium, Univ. of Southern California, Oct. 2012.

14. "Randomized projection algorithms for overdetermined linear systems." Int. Symp. on Mathematical Programming, Berlin, Aug. 2012.

15. "Robust image recovery via total variation minimization." Probabilistic Techniques and Algorithms, Univ. of Texas, Apr. 2012.

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16. "How many measurements: the gap between tractability and intractability." Wavelets and Sparsity, SPIE 2011, San Diego, Aug. 2011.

17. "Acceleration of Randomized Kaczmarz Method via the JL Lemma." Sparse and Low Rank Approximation, Banff, Canada, Mar. 2011.

18. "Compressed sensing with coherent and redundant dictionaries." International Conf. on Numerical Analysis and Applied Mathematics, Rhodes, Greece, Sept. 2010.

19. "Mixed operators in compressed sensing." 13th International Conf.: Approximation Theory, San Antonio, TX, Mar. 2010.

20. "Noisy signal recovery via iterative reweighted L1-minimization." 43rd Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, Nov. 2009.

21. "Greedy signal recovery review." 42nd Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, Oct. 2008.

22. "Greedy signal recovery and uniform uncertainty principles." SIAM Imaging Science: Alternatives to ell-1 minimization for compressed sensing, San Diego, July 2008.

23. "CoSaMP: Greedy signal recovery and uniform uncertainty principles." Davis SIAM Student Research Conf., May 2008.

24. "Greedy signal recovery and uniform uncertainty principles." SPIE's 20th Annual Symposium: Computational Imaging VI, San Jose, Jan. 2008.

Colloquia

1. "Less is More: Compressed sensing and imaging." Colloquium, Dept. of Mathematics and Statistics, Univ. of Nevada, Aug. 2014.

2. "Analysis and synthesis methods in sparse approximation." Colloquium, Dept. of Electrical and Systems Engineering, Univ. of Pennsylvania, Jan. 2014.

3. "Analysis and synthesis methods in sparse approximation." Colloquium, Dept. of Mathematics, Rensselaer Polytechnic Institute, Dec. 2013.

4. "Analysis and synthesis methods in sparse approximation." Colloquium, Dept. of Mathematics, Fordham University, Dec. 2013.

5. "Analysis and synthesis methods in sparse approximation." Colloquium, Dept. of Mathematics, University of Minnesota, Dec. 2013.

6. "Less is more: Robust image recovery via total variation minimization." Colloquium, Dept. of Statistics, Univ. of California, Riverside, Nov. 2012.

7. "Less is more: Robust image recovery via total variation minimization." Colloquium, Claremont McKenna College, Mar. 2012.

8. "Robust image recovery via total variation minimization." Colloquium, California Institute of Technology, Mar. 2012.

9. "Compressed sensing and redundancy." Colloquium, Massachusetts Institute of Technology, Mar. 2011.

10. "Why it's hot in high dimensions and other phenomena." Colloquium, St. Mary's College of California, Feb. 2011.

11. "Why it's hot in high dimensions and other phenomena." Colloquium, California Lutheran College, Feb. 2011.

12. "Why it's hot in high dimensions and other phenomena." Colloquium, Amherst College, Feb. 2011.

13. "Compressive Sampling and Redundancy." Colloquium, Claremont McKenna College, Jan. 2011.

14. "Why it's hot in high dimensions and other phenomena." Colloquium, Union College, Jan. 2011.

15. "Compressed sensing and redundancy." Colloquium, University of California, Irvine, Jan. 2011.

16. "Compressed sensing and redundancy." Colloquium, North Carolina State University, Jan. 2011.

17. "Compressed sensing and redundancy." Colloquium, Kansas State University, Dec. 2010.

18. "Compressed sensing.", Colloquium, University of Nevada, Apr. 2009.

Invited Seminars

1. "Recovering overcomplete sparse representations from structured sensing." Applied Math Group Seminar, Univ. of Heidelberg (remote), Mar. 19, 2015.

2. "Recovering overcomplete sparse representations from structured sensing." Applied Math Seminar, UC San Diego, Feb. 3, 2015.

3. "Compressed sensing and imaging." Student-run seminar, UC Davis, Dec. 12, 2014.

4. "Stochastic iterative algorithms." Applied Math Seminar, UC Davis, Dec. 11, 2014.

5. "Stochastic gradient pursuit methods and the Kaczmarz Method." Mathematics of Information Seminar, Univ. of British Columbia, Nov. 16, 2014.

6. "Exponential decay of reconstruction error from binary measurements of sparse signals." Applied Math Seminar, San Jose State Univ., Nov. 10, 2014.

7. "Exponential decay of reconstruction error from binary measurements of sparse signals." EE group seminar, North Carolina State University, Oct. 23, 2014.

8. "Exponential decay of reconstruction error from binary measurements of sparse signals." ECE Group Seminar, Georgia Tech, Oct. 21, 2014.

9. "SGD and the Kaczmarz method." Applied Math Seminar, UC Irvine, June 2, 2014.

10. "Analysis and synthesis methods for compressed sensing." Applied Math Seminar, Georgia Tech, Apr. 28, 2014.

11. "Analysis and synthesis methods for compressed sensing." SEAS Seminar, Harvard University, 2014.

12. "Analysis and synthesis methods for compressed sensing." Keck Seminar, Univ. of California, Los Angeles, Jan. 21, 2014.

13. "Analysis and synthesis methods for compressed sensing." Center for Signal and Information Processing (CSIP), Georgia Tech, Oct. 21, 2013.

14. "Analysis and synthesis methods in compressed sensing." Center for Computational Intractability, Princeton University, Apr.2013.

15. "Less is more: Robust image recovery via total variation minimization." Center for Automation, Robotics, and Distributed Intelligence Seminar, Colorado School of Mines, Oct. 2012.

16. "Robust image recovery via total variation minimization." Level Set Seminar, Univ. of California, Los Angeles, July 2012.

17. "Randomized projection method for linear inverse problems." Mathematical Physics Seminar, Univ. of Texas, Austin, Apr. 2012.

18. "Bridging Matrix Recovery Gaps using Manifolds." Algebra, Number Theory, and Combinatorics Seminar, Claremont McKenna College, Feb. 2012.

19. "Why it's hot in high dimensions and other phenomena." Women in Math Seminar, University of Southern California, Nov. 2011.

20. "Randomized Kaczmarz solver for noisy linear systems", Probability Seminar, UC Berkeley, Nov. 2009.

21. "Randomized Kaczmarz solver for noisy linear systems", Probability Seminar, Stanford University, Nov. 2009.

22. "Signal recovery from incomplete and inaccurate measurements via ROMP", SAMPTA'09, Marseilles, France, May 2009.

23. "Greedy algorithms in compressed sensing.", Computational Analysis Seminar, Vanderbilt University, Apr. 2009.

24. "Greedy signal recovery in compressed sensing.", Applied Math Seminar, Stanford University, Sept. 2008.

25. "Sparse reconstruction via Regularized Orthogonal Matching Pursuit." UC Davis Student-Run Seminar, Nov. 2007.

26. "Isoperimetric inequalites and concentration of measure phenomenon." UC Davis Student-Run Seminar, Nov. 2006.

27. "Improving your game skills with probability." UC Davis Math Club: Graduate talks for Undergraduates, Nov. 2006.

Other Presentations

1. "Women in STEM." Alumni Weekend ContinuED talks, Claremont McKenna College, May 2, 2015.

2. "Project Next: Obtaining research funding." Project Next panel, AMS Joint Math. Meeting, San Antonio TX, Jan. 10, 2015.

3. "AMS Short Course on Finite Frame Theory: A Complete Introduction to Overcompleteness: Compressed sensing and dictionary learning." AMS Joint Math. Meeting, San Antonio TX, Jan. 9, 2015.

4. "Mini-course: Compressive signal processing." Enhancing Diversity in Graduate Education (EDGE) program, Claremont, June 2014.

5. "Millenium problems in Mathematics." (Joint talk), Claremont McKenna Athenaeum, Apr. 2013.

6. "Why it's hot in high dimensions and other phenomena." Claremont McKenna Math Club, Feb. 2013.

7. "Less is more: Robust image recovery via total variation minimization." Institute for Pure and Applied Mathematics, UCLA, July 2012.

8. "Stable image reconstruction using total variation minimization." Poster, Challenges in Geometry, Analysis, and Computation, Yale University, June 2012.

9. "Noise stability of functions with low influences: invariance and optimality" Summer School in Geometry and Analysis in the Theory of Computation, Bloomington, Indiana, Aug. 2009.

10. "ROMP and CoSaMP in compressed sensing" Guest Lecture, Compressive Sensing course, Vanderbilt University, Apr. 2008.

11. "Compressed sensing." UC Davis Recruitment Student Talks, Apr. 2008.

12. "Error correction and sparse reconstruction." Qualifying Examination, UC Davis, Dec. 2006.

13. Various topics, VIGRE Study Group in Geometric Functional Analysis, UC Davis, Apr. 2005.

14. "Correlation inequalities and applications, especially to monotone properties (Kleitman's lemma)." The Probabilistic Method in Combinatorics Reading Group, UC Davis, Nov. 2004.

PROFESSIONAL
ACTIVITIES

Journal Reviewing:

ACS Central Science
AMS Mathematical Reviews
Annals of Statistics
Applied and Computational Harmonic Analysis
Applied Mathematics and Computation
BIT Numerical Mathematics
Constructive Approximation
Digital Signal Processing
ETRI Journal
EURASIP Journal on Advances in Signal Processing
European Journal of Applied Mathematics
Foundations of Computational Mathamatics
IEEE Geoscience and Remote Sensing Letters
IEEE Journal of Selected Topics in Signal Processing
IEEE Signal Processing Letters
IEEE Transactions on Aerospace and Electronic Systems
IEEE Transactions on Communications
IEEE Transactions on Information Theory
IEEE Transactions on Network Science and Engineering
IEEE Transactions on Signal Processing
IET Image Processing
IET Signal Processing
International Journal of Computer Science

International Journal of Electronics and Communications
International Journal of Remote Sensing
Inverse Problems
Inverse Problems in Science and Engineering
Journal of Approximation Theory
Journal of Machine Learning Research
Journal of Optimization Theory and Applications
Journal of Sensor and Actuator Networks
Linear Algebra and its Applications
Machine Learning
Machine Vision and Applications
Mathematical Methods in the Applied Sciences
Mathematical Problems in Engineering
Mathematics and Mechanics of Complex Systems
Mathematics of Computation
New Journal of Physics
Numerische Mathematik
Probability Theory and Related Fields
SIAM Journal on Mathematical Analysis
SIAM Journal on Matrix Analysis and Applications
Signal Processing

Conference Reviewing:

2015 IEEE International Symposium on Information Theory (ISIT)
2015 Sampling Theory and Applications (SAMPTA)
2014 IEEE Global Conference on Signal and Information Processing (GlobalSIP)
2010 - 2014 IEEE International Symposium on Information Theory (ISIT)
2014 Military Communications Conference (MILCOM)
2013 International Conference on Sampling Theory and Applications (SAMPTA)
2013 Signal Processing with Adaptive Sparse Structured Representations (SPARS)
2012 ACM Symposium on Theory of Computing (STOC)
2010 IEEE International Conf. on Acoustics, Speech, and Signal Proc. (ICASSP)
2009 International Conference on Sampling Theory and Applications (SAMPTA)

Other Reviewing:

National Science Foundation (NSF), Applied Mathematics
Hawkes Learning Statistical Textbooks
JASA Book Review
Birkhuser/Springer book series "Applied and Numerical Harmonic Analysis"

Other:

Claremont Center for Mathematical Sciences (CCMS) Colloquium co-chair, 2015-2017

Claremont McKenna College Quantitative Studies committee (2015)
SIAM Annual Meeting 2014, *Mathematics of Information and Low Dimensional Models*
    Session co-organizer
Claremont McKenna College Math Club co-organizer, 2013-current
Claremont McKenna College Teaching Resources Center Committee, 2012-2013
UC Davis Mathematics Graduate Program Committee Representative, 2008-2009
UC Davis Math Cafe Tutor, 2008
UC Davis Galois Group Lead Organizer, 2008
UC Davis Student-Run Pure and Applied Math Seminar Organizer, 2007-2008
Univ. of Nevada Mathematics Representative of the Student Advisory Board, 2002

SKILLS
Computation: C, C++, Java, Perl, Python, Maple, Matlab, R

Languages: English, Spanish (semi-fluent), American Sign Language (semi-fluent)