ALYSON "ALLIE" FLETCHER

Assistant Professor
University of California, Los Angeles
8125 Math Sciences Bldg.
Los Angeles, CA 90095-1554

Tel: +1 201 965 1900
http://www.stat.ucla.edu/~akfletcher/

Research Scientist
University of California, Berkeley
Redwood Center for Theoretical Neuroscience
Helen Wills Neuroscience Institute

Citizenships: US & United Kingdom
Email: akfletcher@ucla.edu

EDUCATION

University of California, Berkeley:

Ph.D. in Electrical Engineering and Computer Sciences (EECS), January 2006
A Jump Linear Framework for Estimation with Markovian Source and Channel Dynamics
Committee - EECS: Kannan Ramchandran (chair) & Venkat Anantharam
Mathematics: Alexandre J. Chorin

M.S. in Mathematics, May 2005
Estimation via Sparse Approximation: Error Bounds and Random Frame Analysis
Committee - Mathematics: F. Alberto Grünbaum (chair)
Statistics: David J. Aldous & Bin Yu

M.S. in Electrical Engineering, May 2002
Denoising via Recursive Wavelet Thresholding
Committee - EECS: Kannan Ramchandran (chair) & Laurent El Ghaoui

University of Iowa, Iowa City, Iowa:

B.S. with honors in Mathematics
Minors: Physics & Music

ACADEMIC APPOINTMENTS

Assistant Professor, January 2016–
Statistics, Mathematics, and Electrical Engineering
University of California, Los Angeles

Assistant Professor, September 2012–present
Department of Electrical Engineering
University of California, Santa Cruz

Research Scientist, September 2012–present
Redwood Center for Theoretical Neuroscience
Helen Wills Neuroscience Institute
University of California, Berkeley

Postdoctoral Research Assistant (Advisor: Martin Vetterli), 2009
Computer and Communication Sciences Department
École Polytechnique Fédérale de Lausanne & University of California, Berkeley

University of California President's Postdoctoral Fellow, 2006–2008
Wireless Foundations Center
University of California, Berkeley

HONORS AND AWARDS

National Science Foundation CAREER Award
University of California President's Postdoctoral Fellowship
Eugene Lawler Award, University of California, Berkeley
Henry Luce Foundation – Clare Boothe Luce Fellow
National Science Foundation Graduate Fellowship
Soroptimist Founder's Dissertation Year Fellowship
Sigma Xi, the Scientific Research Society
University of California EECS Graduate Fellowship
University of Iowa President's Scholar and Dean's Scholarships
University of Iowa President's & Dean's Lists
University of Iowa Scholars Day Speaker
University of Iowa Undergraduate Scholar Research Fellow

SELECTED PROFESSIONAL SERVICE AND OUTREACH ACTIVITIES

Cognitive Computational Neuroscience Steering Committee, founding member
Co-organizer, *Brains and Bits: From Neuroscience to Machine Learning*, workshop at NIPS 2016
Co-organizer and instructor, *Data Science and Data Skills for Neuroscientists*, course at
     Society for Neuroscience Annual Meeting 2016
Co-organizer, *Statistical Methods for Understanding Neural Systems*, workshop at NIPS 2015
Co-organizer, *High-Dimensional Statistical Inference in the Brain*, workshop at NIPS 2013
Technical Program Committee Member, Computational and Systems Neuroscience (Cosyne) 2017
Technical Program Committee Member, IEEE International Symp. Inform. Theory (ISIT), 2014
Women in Computer Science and Engineering (WICSE) officer and Big Sister
Girls E-Mentoring in Science, Engineering and Technology (GEM-SET) mentor
Women in Technology Sharing Online (WitsOn) mentor
Fellow of Oakes College (Campus multicultural student community)
Speaker in **#theoryMatters** series, https://youtu.be/uaN9qq7dfjE

PUBLICATIONS (reverse chronological)

JOURNAL PAPERS & BOOK CHAPTERS

1[†] S. Rangan, P. Schniter & A. K. Fletcher, "Vector Approximate Message Passing," submitted for publication, Oct. 2016; arXiv:1610.03082.

2[†] S. Rangan, A. K. Fletcher, V. K. Goyal, E. Byrne & P. Schniter, "Hybrid Approximate Message Passing," submitted for publication, Sept. 2016; arXiv:1111.2581.

3[†] A. K. Fletcher & S. Rangan, "Scalable Inference for Neuronal Connectivity from Calcium Imaging," submitted for publication, Feb. 2015; arXiv:1409.0289.

4. A. K. Fletcher & S. Rangan, "Iterative Reconstruction of Rank-One Matrices in Noise," *Information and Inference, a Journal of the IMA*, to appear; arXiv:1202.2759.

5. S. Rangan, P. Schniter, A. K. Fletcher, E. Riegler & V. Cevher, "Fixed Points of Generalized Approximate Message Passing with Arbitrary Matrices," *IEEE Trans. Inform. Theory*, to appear; arXiv:1301.6295.

6. S. Rangan, A. K. Fletcher, P. Schniter & U. S. Kamilov, "Inference for Generalized Linear Models via Alternating Directions and Bethe Free Energy Minimization," *IEEE Trans. Inform. Theory*, to appear; arXiv:1501.01797.

7. U. S. Kamilov, S. Rangan, A. K. Fletcher & M. Unser, "Approximate Message Passing with Consistent Parameter Estimation and Applications to Sparse Learning," *IEEE Trans. Inform. Theory*, vol. 60, no. 5, pp. 2969–2985, May 2014.

8. A. K. Fletcher, S. Rangan & V. K. Goyal, "Ranked Sparse Signal Support Detection," *IEEE Trans. Signal Process.*, vol. 60, no. 11, pp. 5919–5931, Nov. 2012.

9. A. K. Fletcher & S. Rangan, "Orthogonal Matching Pursuit: A Brownian Motion Analysis," *IEEE Trans. Signal Process.*, vol. 60, no. 3, pp. 1010–1021, March 2012.

10. S. Rangan, A. K. Fletcher & V. K. Goyal, "Asymptotic Analysis of MAP Estimation via the Replica Method and Applications to Compressed Sensing," *IEEE Trans. Inform. Theory*, vol. 58, no. 3, pp 1902–1923, March 2012.

11. A. K. Fletcher, S. Rangan & V. K. Goyal, "Necessary and Sufficient Conditions on Sparsity Pattern Recovery," *IEEE Trans. Inform. Theory*, vol. 55, no. 12, pp. 5758–5772, Dec. 2009.

12. V. K. Goyal, A. K. Fletcher & S. Rangan, "Distributed Coding of Sparse Signals," chapter in *Distributed Source Coding: Theory, Algorithms, and Applications*, Academic Press, 2009.

13. V. K. Goyal, A. K. Fletcher & S. Rangan, "Compressive Sampling and Lossy Compression," *IEEE Signal Process. Mag.*, vol. 25, no. 2, pp. 48–56, March 2008.

14. A. K. Fletcher, S. Rangan, V. K. Goyal & K. Ramchandran, "Robust Predictive Quantization: Analysis and Design via Convex Optimization," *IEEE J. Selected Topics in Signal Process.*, vol. 1, no. 4, pp. 618–632, Dec. 2007.

15. A. K. Fletcher, S. Rangan, V. K. Goyal & K. Ramchandran, "Denoising by Sparse Approximation: Error Bounds Based on Rate–Distortion Theory," *EURASIP J. Applied Signal Process.*, Special Issue on Overcomplete Representations, vol. 2006, March 2006.

LONG PAPERS IN HIGHLY SELECTIVE CONFERENCES

1. A. K. Fletcher & S. Rangan, "Scalable Inference for Neuronal Connectivity from Calcium Imaging," Neural Inform. Process. Syst., NIPS 2014. [*Acceptance: 414/1678=25%, Spotlight: 82/1678, top 4.9%]

2. U. S. Kamilov, S. Rangan, A. K. Fletcher & M. Unser, "Approximate Message Passing with Consistent Parameter Estimation and Applications to Sparse Learning," Neural Inform. Process. Syst., NIPS 2012. [*Acceptance: 370/1467 = 25%]

3. A. K. Fletcher, S. Rangan, L. R. Varshney & A. Bhargava, "Neural Reconstruction with Approximate Message Passing (NeuRAMP)," Neural Inform. Process. Syst., NIPS 2011. [*Acceptance: 305/1400 = 22%]

4. A. K. Fletcher & S. Rangan, "Orthogonal Matching Pursuit from Noisy Measurements: A New Analysis," Neural Inform. Process. Syst., NIPS 2009. [*Acceptance: 263/1105=24%, Spotlight: 87/1105, top 8%]

5. S. Rangan, A. K. Fletcher & V. K. Goyal, "Asymptotic Analysis for MAP Estimation via the Replica Method and Compressed Sensing," Neural Inform. Process. Syst., NIPS 2009. [*Acceptance: 263/1105=24%, Spotlight: 87/1105, top 8%]

6. A. K. Fletcher, S. Rangan & V. K. Goyal, "Resolution Limits of Sparse Coding in High Dimensions," Neural Inform. Process. Syst., NIPS 2008. [*Acceptance: 250/1022 = 24%]

7. A. K. Fletcher, K. Ramchandran & V. K. Goyal, "Estimation from Lossy Sensor Data: Jump Linear Modeling and LMI Analysis," ACM Inform. Process. Sensor Networks 2004. [*Acceptance: 25/145=17%]

OTHER PEER-REVIEWED CONFERENCE PAPERS

8[†] A. K. Fletcher & P. Schniter, "Learning and Free Energies for Vector Approximate Message Passing," submitted for publication, Sept. 2016; arXiv:1602.08207.

9. S. Sarkar, P. Schniter, A. K. Fletcher & Sundeep Rangan, "A New Formulation of Generalized Approximate Message Passing," 50th Asilomar Conf. Signals, Syst. & Computers, 2016.

10. A. Fletcher, M. Sahraee-Ardakan, S. Rangan & P. Schniter, "Expectation Consistent Approximate Inference: Generalizations and Convergence," IEEE Int. Symp. Inform. Theory 2016.

11. P. Schniter, A. K. Fletcher, and Sundeep Rangan, "A Robust Approximate Message Passing Algorithm," IEEE Information Theory Workshop 2016.

12. R. C. Sumner, M. Sahraee-Ardakan, M. Trumpis, M. Insanally, R. Froemke, J. Viventi & A. K. Fletcher, "Neural Mass Spatio-Temporal Modeling from High-Density Electrode Array Recordings," Comput. Syst. Neurosci., CoSyNe, 2016.

13. A. K. Fletcher, "Scalable Inference of Neural Dynamical Systems," 53rd Ann. Allerton Conf. Commun., Control & Computing, 2015.

14. S. Rangan, A. K. Fletcher, P. Schniter & U. S. Kamilov, "Inference for Generalized Linear Models via Alternating Directions and Bethe Free Energy Minimization," IEEE Int. Symp. Inform. Theory 2015.

15. A. K. Fletcher, J. Viventi & S. Rangan, "Neural Mass Spatio-Temporal Modeling from High-Density Electrode Array Recordings," Inform. Theory and Applications Workshop 2015.

16. P. Schniter, S. Rangan & A. K. Fletcher, "Statistical Image Recovery: A Message-Passing Perspective," 2015 Int. Biomedical & Astronomical Signal Process. Frontiers Workshop.

17. S. Rangan, P. Schniter & A. K. Fletcher, "On the Convergence of Approximate Message Passing for Arbitrary Matrices," IEEE Int. Symp. Inform. Theory 2014.

18. A. K. Fletcher, "Bayesian Inference of Neural Connectivity via Approximate Message Passing," Comput. Syst. Neurosci., CoSyNe, 2014.

19. A. K. Fletcher & S. Rangan, "Hybrid Approximate Message Passing for Generalized Group Sparsity," SPIE Wavelets and Sparsity XV, 2013.

20. S. Rangan, P. Schniter, E. Riegler, A. K. Fletcher, V. Cevher, "Fixed Points of Generalized Approximate Message Passing with Arbitrary Matrices," IEEE Int. Symp. Inform. Theory 2013.

21. S. Rangan & A. K. Fletcher, "Iterative Estimation of Constrained Rank-One Matrices in Noise," IEEE Int. Symp. Inform. Theory 2012.

22. A. K. Fletcher, S. Rangan & P. Schniter, "Hybrid Generalized Approximate Message Passing with Applications to Structured Sparsity," IEEE Int. Symp. Inform. Theory 2012.

23. S. Rangan, A. K. Fletcher & V. K. Goyal, "Extensions of Replica Analysis to MAP Estimation with Applications to Compressed Sensing," IEEE Int. Symp. Inform. Theory 2010.

24. A. K. Fletcher, S. Rangan & V. K. Goyal, "A Sparsity Detection Framework for On–Off Random Access Channels," SPIE Wavelets XIII, 2009.

25. S. Rangan, A. K. Fletcher & V. K. Goyal, "A Sparsity Detection Framework for On–Off Random Access Channels," IEEE Int. Symp. Inform. Theory 2009.

26. A. K. Fletcher, S. Rangan & V. K. Goyal, "On Subspace Structure in Source and Channel Coding," IEEE Int. Symp. Inform. Theory 2008.

27. A. K. Fletcher, S. Rangan & V. K. Goyal, "Rate-Distortion Bounds for Sparse Approximation," IEEE Workshop on Statistical Signal Process. 2007.

28. A. K. Fletcher, S. Rangan & V. K. Goyal, "On the Rate-Distortion Performance of Compressed Sensing," IEEE Int. Conf. Acoustics, Speech, & Signal Process. 2007.

29. A. K. Fletcher, S. Rangan, V. K. Goyal & K. Ramchandran, "Causal and Strictly Causal Estimation for Jump Linear Systems: An LMI Analysis," Conf. Inform. Sci. & Syst. 2006.

30. A. K. Fletcher, S. Rangan, V. K. Goyal & K. Ramchandran, "Analysis of Denoising by Sparse Approximation with Random Frame Asymptotics," IEEE Int. Symp. Inform. Theory 2005.

31. A. K. Fletcher, S. Rangan & V. K. Goyal, "Sparse Approximation, Denoising, and Large Random Frames," SPIE Wavelets XI, 2005.

32. A. K. Fletcher, S. Rangan, V. K. Goyal & K. Ramchandran, "Optimized Filtering and Reconstruction in Predictive Quantization with Losses," IEEE Int. Conf. Image Process. 2004.

33. A. K. Fletcher, S. Rangan, V. K. Goyal, K. Ramchandran, "Robust Predictive Quantization: A New Design and Optimization Methodology," IEEE Int. Symp. Inform. Theory 2004.

34. A. K. Fletcher, V. K. Goyal & K. Ramchandran, "On Multivariate Estimation by Thresholding," IEEE Int. Conf. Image Process. 2003.

35. A. K. Fletcher & K. Ramchandran, "Estimation Error Bounds for Denoising by Sparse Approximation," IEEE Int. Conf. Image Process. 2003.

36. A. K. Fletcher, V. K. Goyal & K. Ramchandran, "Iterative Projective Wavelet Methods for Denoising," SPIE Wavelets X: Applications in Signal & Image Process., 2003.

37. A. K. Fletcher & K. Ramchandran, "Estimation Error Bounds for Frame Denoising," SPIE Wavelets X: Applications in Signal & Image Process., 2003.

38. A. K. Fletcher, K. Ramchandran & V. K. Goyal, "Wavelet Denoising by Recursive Cycle Spinning," IEEE Int. Conf. Image Process. 2002.

SELECTED INVITED WORKSHOPS AND TALKS

1. smml:2017: Exploring the interface between statistical mechanics and machine learning, University of California, Berkeley, January 12–13, 2017.

2. Workshop on Statistical Physics, Learning, Inference and Networks, École de Physique des Houches, February 26–March 3, 2017.

3. "Scalable Approaches to New Large-Scale Neuroscience," IEEE Signal Processing Society, Silicon Valley Chapter, Nov. 5, 2015.

4. "Scalable Inference of Neural Dynamical Systems," 53rd Annual Allerton Conference on Communication, Control & Computing, University of Illinois at Urbana-Champaign, Oct. 3, 2015.

5. "Structured Estimation of Visual Receptive Fields," Bay Area Vision Research Day (BAVRD), Sep. 18, 2015.

6. "Inference for New Large-Scale Neuroscience," Mining and Modeling of Neuroscience Data, CRCNS/MSRI Summer School, University of California, Berkeley, July 15, 2015.

7. "Inferring Structure in Large Neural Systems," Mathematics & Statistics Department Seminar, Boston University, March 19, 2015.

8. "Inferring Structure in Large Neural Systems," Data Seminar: Departments of Mathematics, Electrical Engineering & Biomedical Engineering, Duke University, March 13, 2015.

9. "Inferring Structure in Large Neural Systems," Department of Statistics Seminar, University of California, Los Angeles, March 10, 2015.

10. "Inferring Structure in Large Neural Systems," Applied Mathematics & Statistics Department Seminar, Johns Hopkins University, February 27, 2015.

11. "Inferring Structure in Large Neural Systems," Applied Mathematics & Electrical Engineering Seminar, Harvard University, February 25, 2015.

12. "Inferring Structure in Large Neural Systems," Applied Mathematics Seminar, University of Washington, February 19, 2015.

13. "Inferring Structure in Large Neural Systems," Department of Mathematics and Statistics Seminar, University of San Francisco, February 10, 2015.

14. "Uncovering Structure in Neural Systems," Information Theory and Applications Workshop, University of California, San Diego, February 6, 2015.

15. Stanford Compression Forum, Palo Alto, CA, January 22, 2015.

16. "Scalable Identification for Structured Nonlinear Neural Systems," Redwood Center for Theoretical Neuroscience Seminar, University of California, Berkeley, May 7, 2014.

17. "Scalable Identification for Structured Nonlinear Neural Systems," University of California, Berkeley, Control Theory Seminar, March 10, 2014.

18. "Bayesian Inference of Sparse Neural Dynamical Systems," Information Theory and Applications Workshop, University of California, San Diego, February 13, 2014.

19. "Scalable Identification for Structured Complex Nonlinear Systems," University of California, San Diego, ECE Seminar, January 30, 2014.

20. Co-organizer, *International Workshop on High-Dimensional Statistical Inference in the Brain*, Neural Information Process. Syst. (NIPS), 2013 (Lake Tahoe, NV, Dec 5-10).

21. "Learning Sparse Priors in Approximate Message Passing," Information Theory and Applications Workshop, University of California, San Diego, February 13, 2013.

22. "Seeking Sparsity: Theory Toward Application" University of California, Santa Cruz, May 21, 2012.

23. "Neural Connectivity and Receptive Field Estimation via Hybrid Message Passing," Information Theory and Applications Workshop, University of California, San Diego, February 6, 2012.

24. "Graphical Models for Sparse Estimation and Neuroscience," Electrical Engineering Seminar, University of California, Santa Cruz, January 30, 2012.

25. "Sparsity: Algorithms and Applications in Neuroscience," Applied Mathematics and Mathematical Biology Seminar, Claremont Graduate University, January 25, 2012.

26. "Exploiting Sparsity: Algorithms and Applications," Electrical and Computer Engineering Seminar, University of California, Davis, November 14, 2011.

27. "Generalized Approximate Message Passing and Applications in Neural Receptive Field Estimation and Connectomics," Redwood Center for Theoretical Neuroscience, University of California, Berkeley, June 8, 2011.

28. "Algorithms for High-Dimensional Inference: Analysis and Applications," University of California, Davis, Department of Electrical and Computer Engineering, May 2011.

29. "Algorithms for High-Dimensional Inference: Analysis and Applications," University of Massachusetts Department of Electrical and Computer Engineering, April 20, 2011.

30. "Algorithms for High-Dimensional Inference: Analysis and Applications," University of Florida Department of Electrical and Computer Engineering, April 20, 2011.

31. " High Dimensional Inference ABC's: Applications, Bounds and Computational Methods," University of Illinois at Chicago, Electrical Engineering Department, April 13, 2011.

32. "Compressed Sensing to the Limits: Bounds, Algorithms, and Wireless Applications," University of Michigan Electrical Engineering and Computer Science Seminar, March 31, 2009.

33. "Sparsity Recovery: Limits, Algorithms and Wireless Applications," DIMACS/DyDAn Working Group on Streaming, Coding, and Compressive Sensing: Unifying Theory and Common Applications to Sparse Signal/Data Analysis and Processing, New Brunswick, NJ, March 25–26, 2009. (By invitation only workshop speaker and participant.)

34. "Sparsity Pattern Recovery: Precisely Contrasting Thresholding, Lasso, and Maximum Likelihood," University of California at San Diego Information Theory and Applications Workshop, February 8–13, 2009.

35. "Random Access Channels and Sparsity Detection," University of California at San Diego Information Theory and Applications Workshop, February 8–13, 2009.

36. American Institute of Mathematics Workshop on Frames for the Finite World: Sampling, Coding, and Quantization, August 18–22, 2008 (invited participant).

37. Banff International Research Station Workshop on Mentoring for Engineering Academia II, July 22–27, 2007 (invited participant), Banff, Alberta, Canada.

38. "Compressed Sensing as a Source Coding Technique," 2007 von Neumann Symposium on Sparse Representation and High-Dimensional Geometry, July 8–12, 2007, Snowbird, UT.

39. "On Encoding with a Codebook of Subspaces," University of California at San Diego Information Theory and Applications Workshop, January 29, 2007.

40. "Rate-Distortion Performance of Sparse-Signal Coding with Random Measurements," SIAM Conference on Imaging Science, May 15, 2006, Minneapolis, MN.

41. University of California at San Diego Workshop on Information Theory and Its Applications, February 6–10, 2006 (invited participant).

42. "Estimation and Robust Communication of Signals with Markovian Losses," École Polytechnique Fédérale de Lausanne, Computer and Communication Sciences Department, July 14, 2005, Lausanne, Switzerland.

43. "Estimation with Markovian Dynamics and Sparseness," University of California, Berkeley, Networking/Communication/DSP Seminar, April 20, 2005, Berkeley, CA.

44. UCLA Institute for Pure and Applied Mathematics (IPAM) Program on Multiscale Geometry and Analysis in High Dimensions, Fall 2004.

45. PAESMEM/Stanford School of Engineering Workshop on Mentoring in Engineering, June 21–22, 2004.

46. "Sparseness from Redundancy: Denoising Methods and Bounds," University of Cambridge, Department of Engineering, Signal Processing Seminar, October 2, 2003, Cambridge, UK.

47. "Wavelet Denoising by Recursive Cycle Spinning," DIMACS Workshop on Source Coding and Harmonic Analysis, May 9, 2003, New Brunswick, NJ.

FUNDING

Agency	Amount	Date	Role	Description
NSF	$1,200,000	07/2016 – 06/2020	PI with Co-PIs J. Viventi (Duke) and S. Rangan (NYU)	CIF: Medium: Scalable Learning of Nonlinear Models in Large Neural Populations
ONR	$67,974	06/2015 – 01/2016*	Sole PI	State Estimation for Generalized Linear Dynamical Networks
NSF	$510,000	01/2013 – 12/2017	Sole PI	CAREER: Structured Nonlinear Estimation via Message Passing: Theory and Applications

*Initial phase of grant, subsequent award to occur after move to UCLA

STUDENTS ADVISED

PhD students

- Melikasadat Emami, started 2016
- Parthe Pandit, started 2016
- Mojtaba Sahraee, started 2015
- Robert Sumner, started 2015

Masters students

- Zoe Xia – UCSC
- Alberto Fitting – UCSC

Undergraduates

- Sierra Catelani – UCSC

PROFESSIONAL SERVICE

Reviewer for Conferences:
    International Conference on Machine Learning, ICML
    Conf. Neural Information Processing Systems, NIPS
    IEEE Int. Conference on Acoustics, Speech & Signal Processing, ICASSP
    Artificial Intelligence and Statistics
    Conference on Information Sciences and Systems
    IEEE International Conference on Image Processing, ICIP
    IEEE International Symposium on Information Theory
    IEEE American Control Conference
    IEEE Conference on Decision & Control
    ACM International Conference on Information Processing in Sensor Networks
    European Signal Processing Conference
Reviewer for Journals:
    Information and Inference, a Journal of the IMA
    IEEE Trans. on Information Theory
    IEEE Trans. on Automatic Control
    IEEE Trans. on Image Processing
    IEEE Journal of Selected Topics in Signal Processing
    IEEE Trans. on Signal Processing
    EURASIP Journal on Advances in Signal Processing
    PHYCOM: Physical Communication Journal

TEACHING AND MENTORING

UCSC CE/EE293: Sparsity and Dimensionality Reduction
Special topics class in sparsity and low-rank methods in approximation, inverse problems and machine learning. Topics included sparse inverse problems, convex relaxations, random matrix theory, optimization methods, dictionary learning and applications in image processing and learning.

UCSC CE/EE262: Introduction to Statistical Estimation and Detection
Graduate-level class in estimation and detection of deterministic and random parameters and processes in noise, including performance analysis. Also covered binary hypothesis testing, including the Neyman-Pearson Theorem, and maximum likelihood and Bayesian estimation.

UCSC CE/EE153: Digital Signal Processing
Introduced senior-level students to the principles of signal processing, including discrete-time signal and system properties, sampling of continuous-time signals, filter design, and Fourier and z-transform analysis of linear time-invariant systems.

UCSC CE/EE103: Signals and Systems
Introduction to signals and analog and digital signal processing, a topic that forms an integral part of systems in many diverse areas, including seismic data processing, communications, speech processing, image processing, neuroscience, and electronics. Signal and system representations, the Fourier transform, filter and the Laplace transform are all covered.

Women in Technology Sharing Online (WitsOn) mentor – I am involved in this online mentorship program that connects college students with prominent women in engineering, technology, science, and mathematics.

Girls E-Mentoring in Science, Engineering and Technology (GEM-SET) mentor – I mentor in this program that links middle and high school girls with female mentors in science, engineering and technology fields. This project is cosponsored by the Center for Research on Women and Gender at the University of Illinois at Chicago. I began as a graduate student and continue in my new role as a faculty member.

Graduate Student Instructor – University of California, Berkeley, *Signals & Systems*, EE120
I was requested multiple times to be a TA for this intermediate undergraduate signal processing course. It is considered challenging due to its breadth and the mathematical level compared to previous courses in the curriculum. I received a highest HKN Departmental TA rating.

Graduate Student Instructor – University of California, Berkeley, *Intro to Electronics*, EE42/100
As a TA for this circuit analysis class—which is an introductory course for pre-computer science students—I led discussion and laboratory sessions, designed and graded homeworks and exams, and often guest lectured for the visiting instructor. I tied for the highest teaching rating that semester.

Teaching Assistant – University of Iowa, *Computers in Engineering*, 57:017
With the rare opportunity of being an undergraduate TA, I initially was responsible for laboratory and lecture sessions on computer architecture and machine language programming. My final summer, the professor and I redesigned the entire course to incorporate programming in C/C++, which entailed new experiments, syllabus, books, and the purchase of lab equipment.

Tutor for Iowa Department for the Blind – Two years position tutoring a newly-blind Iranian student in rhetoric, literature, chemistry, and mathematics courses at the University of Iowa.

Learning Center Supervisor & Instructor – University of Iowa Dept. of Intercollegiate Athletics. Supervised and instructed small groups of student athletes in physics, twenty hours a week in any physics, chemistry, statistics, or mathematics courses.

University of Iowa Tutor Referral Service: Tutor – Privately tutored approximately 80 students in mathematics, English, writing, statistics, and the physical sciences while an undergraduate.

WICSE Big-Sister Mentor – Senior graduates mentor beginning students during their first few years at Berkeley–guiding them through the undergraduate–graduate transition and assisting them in selecting courses and advisors.

SHORT BIOGRAPHY

Alyson K. Fletcher joined UCLA as an Assistant Professor of Statistics, Mathematics, and Electrical Engineering in January 2016. She was the recipient of a 2013 NSF CAREER award and was a UC President's Postdoctoral and Claire Boothe Luce Fellow. Her research interests are in applied mathematics including inverse problems, statistical physics, dynamical systems, machine learning, and information theory. Dr. Fletcher's recent focus is on high-dimensional inference problems in systems neuroscience, particularly neural mapping, and auditory and visual perception.

REFERENCES

A. Robert Calderbank	Director of the Information Initiative, Duke University
Michael Elad	Professor of Computer Science, Technion - Israel Institute of Technology
Konrad Koerding	Professor, Physical Medicine and Rehabilitation, Physiology, Northwestern Univ. CI Chair, Rehabilitation Institute of Chicago
Andrea Montanari	Professor of Statistics, Stanford University
Bruno Olshausen	Director, Redwood Center for Theoretical Neuroscience, Univ. California, Berkeley Professor, Helen Wills Neuroscience Institute & School of Optometry
Kannan Ramchandran	Professor of Electrical Engineering & Computer Sciences, Univ. California, Berkeley
Eero Simoncelli	Professor of Neural Science, Mathematics, & Psychology, New York University Howard Hughes Investigator
Martin Vetterli	President of the National Research Council, Swiss National Science Foundation President, École Polytechnique Fédérale de Lausanne (starting January 2017)